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THE PALGRAVE HANDBOOK OF KNOWLEDGE MANAGEMENT

Edited by Jawad Syed, Peter A. Murray, Donald Hislop and Yusra Mouzughi

The Palgrave Handbook of Knowledge Management

Jawad Syed • Peter A. Murray
Donald Hislop • Yusra Mouzughi
Editors

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Editors
Jawad Syed
Suleman Dawood School of Business
Lahore University of Management Sciences
Lahore, Pakistan

Donald Hislop
School of Business and Economics
Loughborough University
Loughborough, Leicestershire, UK

Peter A. Murray
School of Management and Enterprise,
Faculty of Business, Education,
Law and the Arts, University of
Southern Queensland
Toowoomba, QLD, Australia

Yusra Mouzughi
Muscat University
St Helens, Merseyside, UK

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Contents

Notes on Contributors

Rick Aalbers is Associate Professor in Strategy and Innovation in the Department of Business Administration at Radboud University Nijmegen, the Netherlands. He has been a visiting scholar at Imperial College London and the National University of Ireland at Galway. His research focuses on organisational restructuring and revolves around collaboration and intra-firm network intervention, organisational restructuring and downsizing, and organising for innovation. His work has been accepted for publication in journals such as *Research Policy*, *Journal of Product Innovation Management*, *MIT Sloan Management Review*, *Journal of Engineering and Technology Management*, *Journal of Business Strategy*, *Management Decision*, *Innovation*, *Ivey Business Journal* and *British Journal of Management*. A native of the Netherlands, he holds a Master's degree in business administration from Rotterdam School of Management, a second Master's degree in Business Economics (cum laude) from Erasmus University's School of Economics and a PhD in Business and Economics from Groningen University, the Netherlands. Prior to his academic career, he worked as a manager at Deloitte Consulting, where he advised on strategic change in the financial services industry.

Suleiman Al-Toubi is a retired, former Oil South director for Petroleum Development Oman (PDO). He has over 40 years of working experience, two with port services and 39 with the oil and gas industry. He started his oil and gas career with PDO in 1978 as an apprentice and was awarded his first formal qualification of City and Guilds in electrical installations and regulations from Leicester College of Technology, UK, in 1979. He later attained a number of other academic achievements from various UK institutes in both technical and business management. He has held a number of technical and managerial roles within PDO and Shell Nigeria, including executive leadership roles that are strategically important for developing and producing oil and gas safely and economically.

Joaquín Alegre is Professor of Innovation Management at the University of Valencia, Spain, where he teaches subjects related to innovation, technology and strategic management. He holds a PhD in management from the Jaume I University, Spain. He is interested in innovative organisations, knowledge management and organisational learning.

Bejan David Analoui is Senior Lecturer in Leadership in the Department of Management at the Business School, University of Huddersfield, UK. His research interests include leadership, knowledge management, and teaching and learning. He has published in Journal of Management Development and International Journal of Management Education.

Amr Arisha is Founder and Director of 3S Group, College of Business, Dublin Institute of Technology (DIT) and Head of the Graduate Business School at DIT, Ireland. He received his PhD in industrial engineering from Dublin City University, Ireland, in 2003 for his work on Risk Assessment in Intel-Ireland semiconductor fabrication. He has published more than 75 journal and international conference articles on organisational effectiveness, systems thinking and improvement, and knowledge management. He is a chief examiner in the Marketing Institute of Ireland.

Karen Becker is a professor of Management/HRM at the University of the Sunshine Coast. Becker is an active researcher in the areas of workforce development, learning, unlearning and innovation in the workplace. Her research projects have been funded by public sector organisations and private industry and are published in a range of journals including *Human Resource Management Journal*, *Education and Training*, *International Journal of Human Resource Management* and *Journal of Organisational Change Management*.

Deborah Blackman is Professor in Public Sector Management Strategy in the School of Business at the University of New South Wales, Australia. Her research interests include public sector policy implementation, employee performance management, organisational learning; soft knowledge management; organisational effectiveness; psychological contract; and governance. She publishes extensively in international journals such as Public Administration Review, Management Learning, Management Decision and Journal of Knowledge Management, and she is invited to present her work at conferences across the world.

Cliff Bowman is Professor of Strategic Management at Cranfield School of Management, UK. He has written 12 books and published more than 60 papers in the strategy field, and he has undertaken a range of consulting assignments. His current research interests include complex systems, the fundamentals of organising, and the processes of value creation and value capture.

Guido Bruns is an entrepreneur who operates in the consulting and construction industries. He collaborates with chambers of crafts and education institutions. His research interests include knowledge management and strategic management in small and medium-sized enterprises.

David James Bryde is Professor of Project Management in Liverpool Business School at Liverpool Johns Moores University (LJMU), UK. He studied management sciences/computing at Lancaster and Bradford, UK, and completed a PhD in project management (PM) at LJMU. He is particularly interested in how projects contribute to sustainable development. This includes topics such as relational/psycho-social aspects, lean PM, sustainable procurement in projects, management of customer/supplier networks, knowledge management and the use of innovative processes in PM. He is widely published, with more than 90 journal papers, research monographs, book chapters, conference presentations, invited keynote speeches/guest lectures/presentations, expert interviews and articles.

Aileen Cater-Steel is Professor of Information Systems and Chair of the University of Southern Queensland's (USQ's) academic board. She leads a USQ research group, INVEST (Improving the Net Value of Enterprise Systems and Technology). Her research interests include IT service management (ITSM), IT standards and governance, e-learning systems, and IT outsourcing. In 2016 she was honoured with a lifetime achievement award from IT Service Management Forum (itSMF). She was lead chief investigator on two ITSM projects funded by the Australian Research Council. She has received a citation for outstanding contribution to student learning from the Australian Learning & Teaching Council and was awarded the Australian Council of Professors and Heads of Information Systems prize for her PhD thesis. She has published more than 100 peer-reviewed articles and co-edited five research books. Prior to her academic appointment, she worked in the private sector and government organisations where her career progressed from programmer to IT manager. She is a fellow of the Australian Computer Society and a graduate member of the Australian Institute of Company Directors.

Geoffrey R. Chapman is Lecturer in Human Resources Management and Strategic Management in the School of Business and Law at Central Queensland University, Australia. His research background spans the broad areas of human resource management, positive organisational behaviour, psychometric profiling and issues related to the ageing workforce. His recent work has been focused on psychological capital, turnover and retention, and crowdfunding.

Ricardo Chiva is Professor of Management and Organizations at Jaume I University, Spain, where he teaches subjects related to organisational change and learning, and human resource management. He has a PhD in management from Jaume I University

and an International MBA from the European School of Management (ESCP Europe). He is interested in the development of a new vision of organisations as sites where innovation, learning and humanism are essential elements. His research interests are focused mainly on organisational learning, innovation, and the human aspects of organisations, including organisational and human development.

Susanne Durst is Associate Professor (Reader) in the School of Business at the University of Skövde, Sweden, and Professor of Business Administration at University of the Pacific, Peru. She is also the leader of the research group Knowledge and Innovation Management at the School of Business at University of Skövde. Her research interests include small business management, small and medium-sized (SME) business transfers, knowledge management, knowledge risk management and corporate governance. She has been conducting several national and international research projects on company succession, corporate governance, and knowledge management in SMEs and public organisations. Her work has been recognised through different awards, including the Transeo Academic Award in 2012, and has been published in international peer-reviewed journals. Before joining academia, she worked in different positions with private enterprises of different industries and size.

Dieter H. Früauff is Senior Vice President at Fraport AG. He began his career at Frankfurt Airport in the Financials Department, where he worked for more than ten years. He was Head of Financial Accounting in the utilities industry in Germany. He earned a Doctor of Business Administration degree at Liverpool John Moores University, UK. His research focused on knowledge management for service providers and process optimisation of administrative processes.

Silvia Gherardi is Senior Professor of Sociology Organization in the Department of Sociology and Social Research at the University of Trento, Italy, where she founded the Research Unit on Communication, Organizational Learning and Aesthetics. She is also Professor II in the Faculty of Education at the University of Oslo, Norway. Her research interests include feminist studies, entrepreneurship, epistemology of practice, and qualitative methodologies in organisation studies. She has published two books on practice-based studies: How to Conduct Practice-Based Studies (2012), and Learning and Knowing in Practice-Based Studies (2012), co-authored with Antonio Strati.

Hank Malik is an experienced knowledge management (KM) practitioner with over more than eighteen 18 years of working extensively in the field of KM, engaging in both the private and public sectors including central and local government, education and military in the UK and internationally. Hank He is a recognised KM subject matter expert with skills in delivering KM solutions with a blend of people, process, content, learning and technology. He has implemented KM internationally, including in the Middle East, Europe, the USA and Japan for multiple industry sectors. He has led numerous KM teams and has spoken at various international KM conferences.

Hank He has written a number of papers in on KM and he is a certified as Master CKM with the KM Institute

Helena Heizmann is Senior Lecturer at the University of Technology Sydney, Australia. She has a PhD in international communication from Macquarie University, Sydney. Her research focuses on knowledge sharing, communication and learning across professional, cultural and discursive boundaries. Her research is published in peer-reviewed international journals such as Management Learning, Journal of Knowledge Management, International Journal of Human Resource Management and Journal of International Management.

Donald Hislop is Professor in the Sociology of Contemporary Work in the School of Business and Economics at Loughborough University, UK. In relation to the topic of knowledge management, his interests are focused on social-cultural issues, such as how they shape the character of knowledge processes and people's motivation to participate in them. His most recent project in this area was on the topic of unlearning (the process of abandoning and giving up knowledge) among managers at UK hospitals.

Kerrie Howard is pursuing doctoral research in the School of Management at the University of Bath, UK, into how firms strategise in CSR. She has a primary research and practitioner interest in strategy development and implementation in complex settings. She also advises clients such as UN Women, United Nations Population Fund, United Nations Capital Development Fund, and large companies and international non-governmental organisations on varied aspects of strategy, including knowledge management. Her background is in the international human rights and humanitarian field, where previously she served as Deputy Director at Amnesty International Headquarters, leading research and strategy for the Americas.

Léo Joubert is a PhD candidate in sociology at CNRS LEST and Aix-Marseille University, France. His research interests are focused on Wikipedia, online commitment and online community governance.

Marion Kahrens is Lecturer at the European College of Business and Management, London, UK. Her main responsibilities include teaching on academic research methodology of graduate programmes and supervision of Master's dissertations. She has a DBA from Liverpool John Moores University, and her main research topic is strategic management. Formerly she was a senior manager at a management and technology consultancy company. Thus she has successfully implemented business process concepts and knowledge management frameworks.

Oliver Kayas is Senior Lecturer in Business Technology in the Faculty of Business and Law at Manchester Metropolitan University, UK. His research is concerned with the impact of information systems in organisations, particularly the consequences of

surveillance technologies on the workforce. He is a board member of the UK Academy for Information Systems and has served as guest editor for International Journal of Retail and Distribution Management. His professional background is in the management of IT systems with respect to customer relationship management, policies and procedures.

Alex Kevill is Lecturer in Enterprise in the Centre for Enterprise and Entrepreneurship Studies at the University of Leeds, UK. His research interests include social entrepreneurship, and understanding dynamic capabilities and knowledge management within the context of small and micro enterprises. He has published in International Small Business Journal and International Journal of Entrepreneurial Behaviour and Research.

Bastiaan Klaasse is Affiliated Junior Researcher at the Centre for Organization Restructuring, Radboud University, the Netherlands. He has a Master's degree in business administration from that university. His research interests focus on organising innovative knowledge transfer.

Eric Kong is Senior Lecturer in the School of Management & Enterprise at the University of Southern Queensland, Australia. His current research interests include intellectual capital, knowledge management and non-profit strategic management. He has more than 80 publications, including international refereed journal articles, refereed conference papers, scholarly research book and book chapters. In 2011 his paper in Journal of Intellectual Capital was highly commended by Emerald Literati. Another paper received the Distinguished Paper Award at the 2014 International Symposium on Business and Management, Meiji University, Tokyo, Japan. He was nominated as the Chair of the Best Paper Award for the Public and Non-profit Division at the Academy of Management conference in 2008 and again in 2010. Prior to joining academia, he worked in human resources, and in training and development in the private sector for ten years.

Rafael Lapiedra is currently dean of the Faculty of Law and Economics at Jaume I University, Spain, and Professor of Management at this university, where he teaches subjects related to strategic management and information systems. He has a PhD in Business Administration from Jaume I University and a Master's in European Business Management and Information Systems from Anglia Polytechnic University, UK. He has been visiting professor at the Metropolitan University of Technology of Santiago, Chile, and at the London School of Economics and Political Science, UK.

Jakob Lauring is Professor in the Department of Management at Aarhus University, Denmark. His research interests are focused on different themes within international and cross-cultural management. One of his main interests is expatriate management and expatriate adjustment. He also conducts research on multicultural teams as co-located or virtual. Here a central theme has been language management. He has

published more than 100 international articles in publications such as Journal of Worlds Business, British Journal of Management, Human Resource Management Journal and International Business Review.

Stephanie A. Macht is Senior Lecturer in Strategic Management in the School of Business and Law at Central Queensland University, Australia. Her research interests revolve mostly around entrepreneurship practice and entrepreneurship education, with a specific focus on crowdfunding, business angels, entrepreneurial learning and authentic entrepreneurship education.

Francesco Miele has a PhD in sociology and social research (information systems and organizations) from the Department of Sociology and Social Research at the University of Trento, Italy. He is a researcher at Bruno Kessler Foundation and also member of the Research Unit on Communication, Organizational Learning and Aesthetics at the University of Trento, Italy. He teaches human resource management at the University of Trento and the sociology of health at the University of Verona, Italy.

His recent research interests include the technology-mediated coordination of healthcare professionals and patients in telemonitoring, the management of chronic diseases at home and workplace health promotion initiatives.

John Mingers is Professor of Operational Research and Information Systems at Kent Business School, University of Kent. His research interests include research metrics; the nature of information, meaning and knowledge; the use of systems methodologies in problem situations—multimethodology; and the philosophy of critical realism. He is an Academician of the Academy of the Social Sciences, and has been an associate editor for *MIS Quarterly*.

Sandra Miralles is qualified in business studies and has a superior degree in labour sciences. She has a Master's in work and organisational psychology and human resources from Jaume I University, Spain. She is currently a PhD student in the economics and business research programme and has a full-time research scholarship FPI (Trainee Personal Investigator). Her main research interest is to contribute to the development of the new revolutionary approach based on organisation and people development, aiming to improve conditions for workers, companies and society in general.

Mariam Mohsin is a PhD student in the Suleman Dawood School of Business at Lahore University of Management Sciences, Pakistan. She has served as a lecturer in the Department of Business Studies at Pakistan Institute of Development Economics. Her research interests include gender and diversity in organisations, human resource management and knowledge management.

Yusra Mouzughi is Professor of Management and Interim Vice-Chancellor at the newly formed Muscat University, Oman. She received her PhD in knowledge man-

agement from the UK. Her thesis focused on critical success factors for knowledge management in the financial services sector. She has developed a cross-disciplinary research profile spanning knowledge sharing and the sustainability agenda. She has supervised many doctoral theses in the broad management area. She has numerous publications in the field and is an invited keynote speaker at many international conferences. Prior to joining academia, she worked as a project manager in the financial services sector in the UK.

Peter A. Murray is Professor of Management at the University of Southern Queensland, Australia, with previous affiliations at Macquarie University and the University of Western Sydney. He is an applied researcher in strategic change and diversity management, and he lectures more broadly on strategic management, change management and human resource management. He is also an associate editor, editorial board member and/or reviewer for many leading journals, including Human Resource Management Journal, International Journal of Human Resources and Personnel Management and Management Learning. His most recent book is Contemporary Strategic Management: An Australasian Perspective (2014). He has been a leading researcher for many government reports, books and Quartile 1 and 2 ranked journal articles such as Human Resource Management Journal, Management Learning, Supply Chain Management, International Journal of Human Resource Management and Asia Pacific Journal of Human Resources.

Claude Paraponaris has a PhD in industrial economics from the University of the Mediterranean, France. He is Professor at Aix Marseille University and a researcher at CNRS LEST, France. He has been an expert in deep research for European Community (EC) focused on science–industry relations. He has written two books and more than 80 articles for peer-reviewed journals and conferences. He is President of the French Society of Knowledge Management. His research interests include innovation and knowledge management, multinational information systems, shared creativity, epistemic communities and network effects.

Mohamed A. F. Ragab is a researcher in the 3S Group in the College of Business at Dublin Institute of Technology (DIT), Ireland, and Secretary General of Pharos University in Alexandria, Egypt. He received his BSc in industrial engineering and his MBA from the American University in Cairo, and his PhD in Knowledge Management from DIT in 2015. His work has been published in Knowledge Management Research and Practice and Journal of Knowledge Management, and he has received a Highly Commended Paper Award for Academic Excellence from Emerald Publishing Group.

Agoes Ganesha Rahyuda is Senior Lecturer in the Faculty of Economics and Busines at Udayana University, Indonesia. He has a Master's degree in quality management from Bandung Institute of Technology, Indonesia, and a PhD in management from the University of Kent, UK. As a teacher, he has taught human resource

management, international business, principles of management and an introduction to business. As a researcher he has published his work in scholarly journals, such as Human Resource Development Review, and presented papers at international conferences, such as those of the Academy of Management. His research focuses on recruitment, training and development, and compensation systems.

Isabel Rechberg is Assistant Professor of Management in the College of Staten Island at the City University New York, USA. She has a PhD in management from the University of Kent, UK. She received a Master's in labour law and relations from the University of Sydney, Australia, and a Bachelor's in business and human resource management from Vesalius College, Belgium. She is committed to bringing awareness about the critical role of individuals in the workplace to assist both individual and organisational performance. Her main academic interests include knowledge management, organisational learning, employee engagement and empowerment.

Birgit Renzl is Full Professor and Chair of Management and Organization at the University of Stuttgart, Germany. She studied International Business Studies at the University of Innsbruck in Austria and at the University of Göteborg in Sweden, and did her PhD research in the field of knowledge management. Her research focuses on knowledge and innovation management, organisational change and leadership. She is a member of the editorial board of Management Learning. In addition, she serves as a member of the advisory board for stiftung nextgen and Competence-Based Strategic Management. She has written more than 80 articles for academic journals and books.

Martin Rost is a research assistant at the Chair of Management and Organization at the University of Stuttgart, Germany. He studied business administration and did his PhD in the field of organisational psychology at the Ludwigs-Maximilians-University Munich, Germany. His research focuses on the behaviour, roles and networks of individuals in the emergence of organisational capabilities, competency management and project management.

Troy Sarina is Senior Lecturer in the Department of Marketing and Management at Macquarie University, Sydney, Australia. His research interests include human resource management, strategic employment relations, labour law and cooperative law. He has had work published in quality journals including Industrial Relations: A Journal of Economy and Society, Journal of Industrial Relations and Asia Pacific Journal of Human Resources. He has also contributed work to international handbooks on cooperative law, employment law and exploratory practice research. He teaches a range of subjects including human resource management, negotiations, change management and employment law.

Anup Shrestha is Lecturer of Information Systems in the School of Management & Enterprise at the University of Southern Queensland, Australia. He has written more than 25 publications, including international refereed journal articles and conference

papers in his areas of research interests, which include IT service management, process assessment, IT process improvement, IT standards, knowledge management, decision support system, and design science research in information systems. His PhD research, working on an Australian Research Council industry linkage grant in the IT service management industry, was awarded the best Australian PhD in Information Systems Australian Council of Professors and Heads of Information Systems prize in 2016 and the Queensland IT innovation award in 2015. Prior to joining academia, he worked in the IT industry for eight years with roles ranging from application programmer to project manager.

Ebrahim Soltani has a PhD from the University of Strathclyde, UK. He is Professor of Quality Management at Hamdan Bin Mohammed Smart University, Dubai, United Arab Emirates. Previously he was Professor of Operations Management at the University of Kent Business School, UK. He has written widely on managing operations improvement initiatives and management in developing countries in a range of publications and presented papers at international conferences. His recent research focuses on global supply chains and how the nature of upstream and downstream supply chain relationships influence the level of product quality.

Juani Swart is Professor in Human Capital Management in the School of Management at the University of Bath, UK. She specialises in knowledge management and the management of knowledge workers. Her research is focused on human capital as a strategic resource, innovation, ambidexterity, and employee attitudes and behaviours. She has published widely in the area of people management in knowledge intensive firms, intellectual capital structures, innovation and knowledge sharing.

Jawad Syed is Dean and Professor of Organisational Behaviour in the Suleman Dawood School of Business, Lahore University of Management Sciences, Pakistan. His main research interests are international human resource management, organisational knowledge, diversity management and business ethics.

Memoona Tariq gained her PhD from the Business School at the University of Huddersfield, UK. Her research lies in the areas of leadership, gender, ethnicity, intersectionality and human resource management. Her current work focuses on gender and knowledge management, and the impact of Islamophobia in Western countries.

Christine Unterhitzenberger is Senior Lecturer in Project Management in the Liverpool Business School at Liverpool John Moores University (LJMU). She studied industrial engineering and management at the University of Applied Sciences in Constance (Hochschule fuer Technik, Wirtschaft und Gestaltung Konstanz) and international project management at the University of Applied Sciences in Stuttgart

(Hochschule fuer Technik Stuttgart), Germany. She did her PhD in the field of project management at LJMU. Her research is focused on relational and psycho-social aspects in projects and temporary multiorganisations. She is particularly interested in how a better understanding and an increased awareness of psycho-social relationships can enhance the project performance and impact on such behaviours as knowledge sharing and organisational learning.

Gillian Wright is Chair of Strategic Marketing and Director of Doctoral Programmes in the Faculty of Business and Law at Manchester Metropolitan University, UK. Her research is concerned with the development of stakeholder-responsive service and the knowledge sharing that underpins this. She is a founder member of the European Doctoral Association and she served for many years as Editor of Marketing Intelligence and Planning. Her professional background is in decision-support information—as a clinical trials scientist in pharmaceuticals and a market analyst for a multinational electronics company.

Ling Eleanor Zhang is Research and Teaching Fellow in the School of Management and Business at King's College London, UK. A key focus of her research is interaction across boundaries, which is manifested in contexts such as boundary spanning of multicultural employees, social categorisation and conflict management between expatriates and host country employees, and language challenges that employees face in subsidiaries of multinational corporations. Her work on bicultural expatriates was nominated for the British Academy Nayef Al-Rodhan Prize for Transcultural Understanding 2016. She has published in International Journal of Human Resource Management and Cross Cultural Strategic Management.

List of Figures

List of Tables

1

Introduction: Managing Knowledge in the Twenty-First Century

Jawad Syed, Peter A. Murray, Donald Hislop, and Yusra Mouzughi

The Historical, Social and Economic Context

The twentieth century was a period of great social, economic and political transformation. One of the most significant economic changes related to the growing importance and role of knowledge as a source of value for organizations. These developments have been such that the current century is arguably epitomized by a knowledge-based economy, where knowledge, information and ideas are the main source of economic growth (Cooke and Leydesdorff 2006). Due to this and other social and technological changes, such as advances and developments in computer and communication technologies, ongoing globalization, increased deregulation and so on, new patterns of work and business practices are being developed. Meanwhile, we are also deal-

J. Syed (✉)
Suleman Dawood School of Business, Lahore University of Management Sciences, Lahore, Pakistan

P. A. Murray
School of Management and Enterprise, Faculty of Business, Education, Law and the Arts, University of Southern Queensland, Toowoomba, QLD, Australia

D. Hislop
School of Business and Economics, Loughborough University, Loughborough, UK

Y. Mouzughi
Muscat University, Muscat, Oman

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ing with new kinds of workers, with new and different skills and preferences. For example, owing to the rise of artificial intelligence, many traditional jobs, including those of managerial and professional workers, as well as manual workers, if they are not being eliminated, are being transformed into ones that require vastly different knowledge and experience to before (Arntz et al. 2016; Ford 2016; Minsky 2007; Susskind and Susskind 2015).

In view of rapid globalization, immigration and communication, the current era is characterized by change, not stability, and this reality confronts most organizations, societies and governments worldwide (Fuligni and Tsai 2015). The knowledge-based economy is reflected in an increasing emphasis on the dissemination and use of knowledge as a source of competitiveness for organizations and countries. This also relates to the issue of creativity. Robinson (2009) suggests that being creative is about making fresh connections so that we see things in new ways and from different perspectives. Particularly in the current digital era, there is a need for educational institutions and organizational structures capable of developing creative, innovative and problem-solving capacities which encourage interdisciplinarity and growth.

The Academic Domain of Knowledge Management

Since 1990s, knowledge management (KM) has emerged as a key discipline to explain how knowledge is created, developed, retained and applied in the workplace and how it enables organizational learning and innovation (Hislop 2010; Quintane et al. 2011; Soto-Acosta et al. 2014). In general, the literature treats KM as a set of practices related to the use of knowledge as a crucial factor to add or generate value (Cardoso et al. 2012; Mouzughi 2013).

It is now more than 20 years since interest in the topic of KM took off in the mid-1990s (Scarbrough and Swan 2001). The initial explosion of interest in the topic was argued by some to be indicative of it being a fad or fashion, with interest likely to not be sustainable in the long term (Hislop 2010). However, contemporary evidence suggests that this is not the case, that the topic is not a passing fad, and that interest in it has sustained itself consistently over the last two decades (Ragab and Arisha 2013; Serenko and Bontis 2013). Further, knowledge management (and the related topic of intellectual capital) has matured into a coherent academic discipline/domain. This is visible in various ways, such as in the number of annual conferences specifi-

cally examining KM-related issues, and also in the number of academic journals devoted to disseminating research on the area. Thus, there are currently about 20 specific journals exclusively covering the topics of knowledge management and intellectual capital.

While the field of KM shows evidence of developing into a coherent academic discipline, it is still relatively immature in this respect. First, it is still at pre-paradigmatic phase, with ongoing debate and a general lack of consensus on some core issues, such as the nature of worker's knowledge, how knowledge work and knowledge workers are conceptualized and so forth. Further, Serenko and Bontis' (2013) analysis suggests that the field of KM is progressing towards becoming what they categorize as a 'reference discipline', a discipline that has a strong theoretical and/or methodological impact on other fields. While KM is still a field which typically borrows, applies and develops concepts from other disciplines (such as management, psychology, information systems), there is increasing evidence that KM literature is being cited and utilized beyond the boundaries of its own discipline.

This Handbook illustrates the depth of research across disciplines. From a strategy perspective, in particular the micro-foundations literature (Barney and Felin 2013; Coff and Kryscynski 2011), scholars are increasingly becoming interested in how different subparts such as knowledge, skills, abilities and other characteristics, aggregate at the human capital resource (HCR) level (Ployhart and Moliterno 2011).

Several recent meta-reviews have called for more attention on the HCR as distinct from human capital (Ployhart et al. 2014; Nyberg et al. 2014). As part of intellectual capital, scholars are cognizant of the fact that human capital is a component of intellectual capital along with social capital and organization capital. However, recent reviews question whether there is much value in empirically examining human capital as an independent construct. Strategy scholars suggest that the complementarity and emergence of resources at the individual level makes it highly improbable that accurate measures can be obtained, such as the link between KSAOs (knowledge, skills and abilities and other skills) and performance in many prior studies. Instead, they indicate that multiple complementarities are required for complex tasks which are both causally related and interactive (Barney and Felin 2013; Nyberg et al. 2014), such that these resources aggregate at the unit level. Similarly, other strategy scholars point to the value of studying how knowledge accumulates to form dynamic capabilities (Eisenhardt and Martin 2000; Hsu and Wang 2012). Here, the emphasis shifts from only focusing on the HCR to understanding how dynamic capabilities are formed. Previous research suggests that as individual resources are aggregated up (Felin 2012), firms are able to build

on the level of embedded heterogeneity by turning multiple bundles of resources into dynamic capabilities (Barney and Felin 2013; Helfat 1997; Helfat and Peteraf 2003).

In this Handbook, the chapter by Murray explores in some detail many of these relationships, pointing to the value of many multidisciplinary approaches to intellectual capital. Finally, given that our focus in the Handbook is on exploring the theory–practice gap, a number of chapters explore the currency of high-performance work systems and the extent to which they support the transformation process from the HCR into valuable functional as well as useable HR policies, with reference to many scholars (Boxall and Macky 2007; Boxall and Macky 2009; Jeong and Shin 2017). In analysing the contributions to KM from these and other disciplines, the Handbook addresses how these processes transform existing stocks of knowledge into new knowledge (Bontis et al. 2002; Lin 2007). However, as we note below, KM researchers have not always been explicit in translating theory to practice, to show how these links evolve.

One characteristic of literature in the KM field that appears to have declined over time is connections with, and impacts on, non-academic practitioners. One indicator of this is a decline in the number of non-academic authors of peer-reviewed KM publications (Serenko et al. 2010). This has led to some talking of a 'theory–practice gap' (Ragab and Arisha 2013), while Heisig et al. (2016) remark on the challenges that still remain in identifying the extent to which investments in KM have tangible and measurable impacts on business performance. This represents a challenge for the KM field, and is a topic that is developed more fully in the final chapter of this Handbook, which discusses (potential) future research directions that could be pursued.

Aims and Objectives of the Handbook of Knowledge Management

This Handbook brings together the latest original scholarship in the field of KM from a variety of disciplines. It provides conceptual and empirical studies from diverse geographical and organizational contexts and, in addition to classical or mainstream approaches, pays specific attention to non-mainstream and non-western approaches to knowledge and its management. The book addresses certain key areas that are relatively underexplored or underdeveloped in the field, such as the impact of KM on performance, the ethics of KM and sustainable KM.

Effective knowledge management is now recognized as an important source of competitive advantage and a key to organizational success. There are generally three core components of KM: people, processes and technology. Some KM approaches take an organizational focus in order to optimize organization design and workflows; some are techno-centric in their orientation, as a means to enhance knowledge integration and creation; some have an ecological focus, where the important aspects are related to people interaction, knowledge and environmental factors as a complex adaptive system similar to a natural ecosystem.

Despite an increasing interest in the competitive advantage that knowledge may provide for organizations and in the significance of knowledge workers and organizational competencies, it is a fact that the notion of knowledge is complex and its relevance to organization theory has been insufficiently developed (Blackler 1995). Approaches to knowledge and its management are also shaped by organizational and cultural contexts; hence, a universal definition may not be possible or appropriate.

This Handbook brings consists of up-to-date studies of the practical application of KM principles and practices as well as advances in KM theory and concepts, in order to catalyse more research in this area. Some of the unique features of the book are as follows: succinct introductions; authoritative reviews of literature and key theories and issues of KM; organizational examples; contextual information about company/industry or country (as appropriate); clear conclusions, and implications for theory and practice. Chapters have been written by well-known scholars, from a diverse range of academic disciplines and countries, reflecting the international and multidisciplinary nature of the topic.

Overall, this Handbook provides a valuable resource for scholars, practitioners and policy-makers involved in the study or/and operationalization of KM initiatives within and outside business organizations. It offers timely, international scholarship covering key topics, debates and issues in the field.

We are confident that the book will be a comprehensive reference work of value to anyone interested in the topic of knowledge management, including but not limited to academics, researchers, scholars, practitioners, managers and policy-makers working in various areas of KM such as management, HRM, technology, manufacturing, education, training, consultancy and public policy.

Structure and Content of the Handbook of Knowledge Management

The book is divided into three main parts: conceptual and theoretical foundations of knowledge management; knowledge management and boundary spanning; and knowledge management in practice. Part I focuses primarily on the conceptual foundations of the field, reviewing developments and debates related to core concepts. Part II gives space to KM activities in cross-boundary concepts, which are an increasingly common context for KM. Such contexts involve collaboration between people or groups with a separate sense of identity and distinctive knowledge bases, such as when collaborations span organizational, cultural, professional or language boundaries. While there are potentially significant benefits to collaborative KM activities in such contexts, the differences that exist between collaborators create challenges. Part III, the final section of the Handbook, has a central focus on the practical application and use of KM practices and concepts in a diverse array of organizational contexts. This part of the book is deliberately designed to be as significant in terms of size as the opening part, on KM concepts, in order to help address the theory–practice gap outlined earlier, and to highlight the potential practical value of the discipline.

It should be noted that while a couple of chapters in this book directly or indirectly deal with IT-related issues pertaining to knowledge management, we deliberately chose not to examine the role of IT in knowledge management activities in depth. This was because the relationship between IT and KM is so complex and extensive that there was insufficient space, even within a few chapters, to fully examine this topic adequately. Indicative of the extent and complexity of the relationship between IT and KM is that in 2016 and 2017, in the Journal of Knowledge Management, there were two separate special issues on the topic, containing more than 20 articles (with Volume 20, Issue 3 examining new ICT for knowledge management in organizations, and Volume 21, Issue 1 considering the relationship between big data and knowledge management). Part of the reason for the complexity of the relationship is the vast and heterogeneous range of technologies that can be utilized for managing knowledge. These include the employment of 'traditional' computer systems to create repositories for codified knowledge, the use of various IT systems, such as e-mail and video conferencing, to facilitate communication and informal knowledge-sharing, the use of various social media technologies (such as wikis) to facilitate the collaborative creation of knowledge resources, and the use of big data and data analytics to manage knowledge via

processes of data mining and analysis, to name but a few. The huge variety of technologies that can be utilized to help with the management of knowledge helps explain why there is such a diverse range of approaches via which information technology can be used to manage knowledge (Newell 2015). Thus, arguably, examining the relationship between IT and KM is something that is better addressed in a separate, specific book, where there would be adequate space to fully explore the topic.

Part I deals with conceptual and theoretical foundations in the field of knowledge management.

In their chapter, 'Critical evaluation of Nonaka's SECI model', Kahrens and Fruauff argue that the capability to create and utilize knowledge represent a company's sustainable competitive advantage. The authors note that organizational knowledge creation is the process of making available and amplifying knowledge created by individuals and connecting it with the KM system. The theory of organizational knowledge creation, first presented by Nonaka (1991), is a paradigm for managing the dynamic aspects of organizational knowledge creating processes. Its central theme is the socialization, externalization, combination and internalization (SECI) model as a knowledge creation process through a continuous dialogue between tacit and explicit knowledge. In their chapter, these authors offer a comprehensive introduction of Nonaka's SECI model as the core of his theory which remained relatively constant and unchanged, while Nonaka's knowledge creation theory has evolved. Furthermore, knowledge creation theory is explained while the SECI model is reviewed from several perspectives and critically evaluated regarding its practical implications.

In their chapter, 'Organizational learning and knowledge management: A prospective analysis based on the levels of consciousness', Chiva, Lapiedra, Alegre and Miralles propose to take into account the levels of consciousness which describe the different stages of human or social evolution. The authors argue that human beings and their social systems, like organizations, advance in stages, evolving by sudden transformations. Every stage represents a particular stadium with an increasing maturity, complexity and consciousness level. A level of consciousness represents a stadium in human and social evolution and implies a framework through which we interpret the world.

In her chapter, 'Knowledge management and unlearning/forgetting', Becker focuses on unlearning and argues that releasing prior knowledge, or at least acknowledging its presence and shortcomings, may hold the key to successful learning and KM, both at the individual and collective level. She clarifies the concept of unlearning and how it applies to individuals and organizations, describes the key theories and models that have been used to

understand unlearning, then analyses individual unlearning and collective unlearning and their implications for knowledge management. She also provides examples of unlearning in practice and identifies implications of unlearning for KM practice.

In their chapter, 'KM and organizational culture', Wright and Kayas draw on the extant literature and their own organizational case study to discuss aspects of KM and organizational culture. Their case study explores the implementation of a KM system in a public authority. They use it as an example of the nature and impact of the implementation of KM on the workforce and management activity and attitudes. The chapter draws on the implementation, resulting changes and the impact on organizational culture that resulted from the introduction of this approach to change.

In their chapter, 'Knowledge management from a social perspective: The contribution of practice-based studies', Gherardi and Miele argue that a social perspective on knowledge, or what counts for knowledge, does not exist independently of social relations and social practices. Their chapter illustrates the travel of ideas around 'knowledge managing' within a social perspective through three processual activities: sharing knowledge and keeping it alive within a community's practices; embedding knowledge in material practices; and innovating as an ongoing process. The authors argue that a social perspective on knowing is based on three types of relations that are established between practices and knowledge: a containment relation, in the sense that knowledge is a process that takes place within situated practices; a mutual constitution relation, in that the activities of knowing and practising interact and produce each other; and an equivalence relation, in the sense that equivalence between knowing and practising arises when priority is denied to knowledge that was in existence before the moment when it was enacted. Their chapter suggests that a social perspective on knowledge management is not a monolithic construction; rather, it has several nuances, and has taken several turns in the time from the appearance of the concept of a community of practice to the development of practice-based studies.

In her chapter titled 'KM, power and conflict', Heizmann draws out perspectives on power in the wider social sciences and discuss these in relation to contemporary debates on power and conflict in KM. Drawing on the work of previous theorists and researchers, the chapter first outlines four different levels or 'layers' at which power may be examined and sheds light on their relevance for KM. The argument put forward in this chapter is that KM literature may benefit, in particular, from paying greater attention to the deeper levels of power referred to here as 'processes power', 'meaning power', and 'systemic power'. The chapter offers an empirical illustration of the different layers of

power, before concluding with a synthesis and implications for theory and practice.

In her chapter, 'Internalized values and fairness perception: Ethics in knowledge management', Rechberg argues for ethical consideration in KM. The chapter explores the effect internalized values and fairness perception have on individuals' participation in KM practices. The author argues that for knowledge to be processed, individual employees need to be willing to participate in KM practices. As knowledge is power, a key constituent of knowledge is ethics, while individuals' internalized values and fairness perception affect knowledge processing. Where an organization claims ownership over knowledge, an individual may perceive that they are being treated unfairly, which may obstruct knowledge processing. The chapter suggests that by adopting ethical KM practices, individual needs are respected, enabling knowledge-processing. Implications point towards an ethical agenda in KM theory and practice.

In their chapter, 'Knowledge assets: Identification and integration', Bowman, Swart and Howard review the literature on the various forms of capital that generate value. Their chapter does so from a viewpoint that moves beyond the linear or normative perspective of how each individual form of capital can be leveraged for success. That is to say, it views knowledge and knowledge assets, such as human, social and organizational capital, as collectively constructed, a social good and integrated. In other words, these assets do not generate value in isolation. The chapter supports the notion that capital is not merely subject to the strategic freedom of the organization, as it is often portrayed in the strategy and performance literature, but that it is essentially a social good which is relational and contextual in nature. The authors review the various types of knowledge assets, which they categorize into human, social and organizational capital. This, in essence, provides a framework for both researchers and organizations to identify knowledge assets. The authors then put forward a detailed case study of a UN agency that illustrates how knowledge in an organization can be identified using the diagnosis of the forms of capital. The case study also illustrates that each form of capital is a social good and can only add value if it is integrated with other forms of knowledge.

In her chapter, 'A gender and leadership perspective on knowledge-sharing', Tariq reviews the extent to which female leaders are considered in theorizing and practices of knowledge management in organizations. The chapter highlights how women have a positive impact when it comes to knowledge-sharing in teams. The review also highlights how existing organizational structures and cultures could be improved to empower female knowledge leaders.

Part II of the book deals with KM and boundary spanning.

In their chapter, 'A conceptual perspective on KM and boundary spanning: Knowledge, boundaries, and commons', Joubert and Paraponaris present boundaries as a construct that enables associating as much as separating. Their chapter begins by presenting a genealogy of the major concepts in the field of knowledge dissemination. The authors lay down the various terms that refer to knowledge boundaries, insisting, in particular, on the persistent misunderstanding about how the learning process leads to knowledge. This conceptual framework helps us distinguish two functions of a boundary—separation and elaboration. The authors then go on to develop this distinction for commercial organizations, and third for non-commercial organizations such as Wikipedia.

In their chapter, 'Organizing innovative knowledge transfer through corporate board interlocks', Aalbers and Klaasse draw on KM and social network literature to examine the relation between corporate board interlocks and a board's commitment to innovation. Based on a sample of Dutch and German publicly listed hi-tech companies, their empirical results indicate intra-industry interlocks supportive of innovative knowledge exchange. Intra-industry interlocks connect the board to non-local knowledge in the form of companies residing outside its respective industry, increasing a board's internal knowledge diversity. Following absorptive capacity theory, upper-echelon relational embeddedness is seen to improve the board's ability to recognize and pursue innovation opportunities. In contrast, no effect was found for interlocks with companies residing outside of the focal industry. Findings add to the knowledge-based theory of the firm, which states that 'the success of firms is up to both their current knowledge and also how they use and develop it' and emphasizes the relevance of upper-echelon relational embeddedness.

In their chapter, 'Knowledge-sharing across national cultural boundaries and multinational corporations', Lauring and Zhang describe and discuss processes of knowledge-sharing between and within multinational corporation (MNC) business units. While knowledge and knowledge-sharing have become increasingly important in all business sectors, this is particularly true for MNCs. A major reason for this is the diversity and dispersion of the MNC: MNCs employ individuals located in different regions with different types of skills and useful knowledge. The sharing of ideas and perspectives can thus be highly valuable in order to create a competitive edge. However, the diverse and dispersed organization of MNCs also creates many challenges for effective knowledge-sharing. Therefore, MNCs need to deal with the paradoxical relationship between these two aspects. Based on empirical research in two Danish MNCs, the authors examine the link between barriers preventing

knowledge-sharing and the social and sociotechnical factors influencing interaction between and within business units. In terms of barriers, they focus on those caused by diversity (cultural and linguistic) and those caused by dispersion (distance and technology). Finally, the authors use two case studies to illustrate two types of behaviour that can develop internally in MNC units hampering knowledge-sharing—namely, knowledge being contained and knowledge being constrained due to certain social and sociotechnical factors.

Part III deals with KM in practice, including its contemporary issues and directions.

In their chapter, 'KM and organizational performance with a case study from PDO, Oman', Malik and Toubi offer a case study of an oil firm in Oman and show empirically that, with carefully chosen test variables and designed field instruments, the desired output to improve organizational performance and KM can be realized. The authors argue that identification of critical success factors, deployment of clear roles and responsibilities for KM stakeholders, visible leadership support and having a KM reward scheme are important catalysts for successful KM deployment in organizations.

In their chapter, 'An exploration of knowledge-sharing practices, barriers and enablers in small and micro-organizations', Kevill and Analoui analyse the opportunities for, and challenges to, knowledge-sharing within small and micro-organizations. In order to achieve this, their chapter seeks to develop deep and contextualized insights into knowledge-sharing practices in two micro-organizations and one small organization. The empirical study comprises 13 semi-structured interviews with managers and employees in two micro-organizations and one small organization based in knowledge-intensive industries. The study helps understand and analyse the enablers of and barriers to knowledge-sharing within these settings. The authors embed these insights within wider KM literature and elucidate implications for practitioners and policy-makers.

In her study of 'Knowledge management in small and medium-sized enterprises', Durst discusses KM in SMEs to raise awareness regarding KM practices in such firms. Given the relevance of SMEs for the prosperity of the majority of countries, advancing this awareness is of utmost importance. The chapter introduces important domains relevant to awareness creation. It also offers an overview of KM practices in SMEs. Following this, reasons for and benefits of KM for SMEs are presented.

In their chapter, 'KM in the public sector', Malik and Toubi review the current status of KM in the public sector from a practitioner's perspective and with the aid of practical examples. The chapter reviews the current challenges in the public sector and considers how KM can address the opportunities to

support, for example, cost effectiveness in operations and delivery through a combination of people, processes and technology enablers. The chapter also examines the status of KM within the public sector and knowledge-based economy. It offers recommendations for implementing KM in the public sector, with a structured set of proven best practices from multiple practitioners.

In their chapter, 'Knowledge management and project management', Bryde, Unterhitzenberger, Renzl and Rost analyse the context, role, structures, processes, procedures and problems associated with managing knowledge in projects. In doing so, the authors particularly focus on the interactions and intersections between KM and project management (PM). The imperative for effective KM can be viewed through the prism of poor performance in relation to PM. The extant research evidence shows that there continue to be deficiencies in PM and that part of the problem is a failure to effectively manage knowledge both within a project and between projects. Hence, there is an urgent need to improve KM in PM. In the chapter, the authors set out the context in which PM takes place, emphasizing the complexities associated with managing projects. They identify four strands to this complexity, namely: the multidimensionality of measures of project success; the diverse and often conflicting perspectives of project stakeholders as to which dimensions are important; the failure to learn lessons and the repetition of the same mistakes on projects; and the fact that projects create temporary structures that often comprise multiple organizations. The authors stress that the existence of these four strands means that PM takes place in a complex environment that has repercussions and creates challenges for effective KM.

In their chapter, 'Elucidating the effect of post-training transfer interventions on trainee attitudes and transfer of training: A mixed methods study', Rahyuda, Syed and Soltani use a mixed methods sequential explanatory approach in their empirical study in Indonesia that explores how post-training transfer interventions (relapse prevention, proximal plus distal goal-setting) influence the transfer of learnt knowledge and skills to the job, either directly or through changes in specific dimensions of trainee attitudes (i.e., readiness to change, autonomous motivation to transfer). Quantitative data were collected from employees (N = 160) who attended time-management training programmes, and analysed using partial least square (PLS) analysis. This was followed by in-depth interviews (n = 16) that focused on participants' perceptions and reactions towards the transfer interventions. Findings suggest that relapse prevention and goal-setting directly and indirectly facilitate training transfer and provide greater insight into the underlying mechanisms that

account for how and why post-training transfer interventions influence trainee attitudes and training transfers.

In their chapter, 'Managing knowledge and learning for process improvement: A software-mediated process assessment approach for IT service management', Shrestha, Kong and Cater-Steel argue that in the fast-changing and dynamic business environment, IT service organizations must continue to improve their learning processes, create knowledge and implement best practices that allow them to deliver innovative and adaptive value adding services for their clients. In their chapter, the authors describe how they applied the software-mediated process assessment (SMPA) approach to assist IT service organizations to conduct process assessments in a transparent and cost-effective manner. In addition, they introduce a knowledge management process cycle that illustrates how KM and learning processes may be used concurrently to achieve process improvement within the SMPA approach for maximum impact in the IT service management (ITSM) sector. The authors discuss three innovative strategies using the SMPA approach to conduct process assessments in the ITSM sector. The practical strategies include (1) adopting the international standards for assessments, (2) facilitating assessments using a decision support system (DSS) tool, and (3) incorporating process assessments for managing knowledge and learning processes.

In their chapter, 'Knowledge management in developing economies: A critical review', Mohsin and Syed note that the notion of KM is generally conceptualized and used in research originating from developed countries in the West. Managers in developing economies face a different sociocultural and economic complex when trying to implement KM systems and there is need for an insight into the way that KM is understood and practised in these economies. With the migration of manufacturing and service industries to developing economies, developing countries, such as China and India, are increasingly relevant and significant due to size of their market and human resources. Thus, there is a need critically to investigate how the cultural, economic and social contexts in these economies interact with organizations and their KM systems. The authors provide a systematic review of KM literature in the developing economy context. The review shows that only a few studies provide a contextually embedded discussion of KM in developing countries. The authors further analyse the studies that provide a contextual analysis, and extract three themes: trust, hierarchy and power. Based on their findings, they present a categorization of research on KM in developing countries along with recommendations for future research.

In their chapter titled 'Knowledge Measurement: From Intellectual Capital Valuation to Individual Knowledge Assessment', Ragab and Arisha provide a

review of different types of knowledge measurement models. Their chapter argues for the need for individual knowledge assessment to elucidate the role of knowledge holders in firm knowledge dynamics, thus allowing for better allocation and retention of human capital. The antecedents and factors of individual knowledge are then explored through the findings of a recent managerial study by the authors. The study is conducted as a first step towards a new individual knowledge assessment platform.

In her chapter on 'Knowledge Management and Communities of Practice', Blackman notes the disconnection between such communities and their capacity to be sustainable over a period of time. She notes that this often emanates from the institutionalized communities and a number of divested interests that exist which make it difficult for COP members to remain interested in the community. In a detailed study of the Canada Public Service (CPS), Blackman notes that three distinctive themes emerged which helped the COP to be sustainable in terms of both its ongoing membership and its capacity to create and transfer knowledge: 1) recognition of value adding by both the members and the CPS; 2) the role of the support personnel; and 3) championship not management. The author discusses these relationships and their effects on the community in some detail. The chapter highlights that the capacity to successfully transfer knowledge is based on organic, bottom-up growth, the continued focus on maintaining the COP's core purpose, and high levels of stakeholder trust and supportive governance structures. This chapter makes a significant contribution to scholarly and practitioner ideas about the long-term sustainability of communities of practice and how to make them successful.

In his chapter entitled 'Enhancing Knowledge Management in the Fourth Industrial Revolution Era: The Role of Human Resource Systems', Sarina suggests that a number of external changes to labour markets and modern economies present threats which could challenge the pivotal role that human resources and organizations play in the creation of new innovation. The author argues that instead of the human resource function attempting to control knowledge, HR scholars and practitioners should nurture knowledge by utilizing HR systems that create an organizational architecture that promotes, rewards and disseminates new knowledge, enabling organizations to respond to the hyper-competitive environments in which they operate. This chapter identifies that at the heart of knowledge management lies an inherent tension between the increasing need for organizations to use HRM systems to access tacit knowledge held by individual workers and the need for individuals to retain an exclusive pool of knowledge to safeguard employment. Sarina notes that there has been a decline in the level of human capital

engaged by organizations, thereby curbing an organization's access to new knowledge (see the chapter by Murray which discusses an advanced theoretical perspective of human capital as a case in point). There has also been an increase in work itself facilitated by online intermediaries that leads to an increase in private transactions between a customer and worker. As a result, these new forms of work systems allow individuals to become more entrepreneurial by contracting with multiple parties demanding their service. However, the author also notes that the capture of tacit knowledge via explicit HR systems has been much more problematic than expected, partly due to the manner in which HR systems have been designed. In summary, this chapter takes a critical look at the factors that affect human resource systems from a KM perspective and is compelling reading.

In their chapter titled 'KM and project management', Bryde, Unterhitzenberger, Renzl and Rost set out four broad issues that are salient to dealing with the different strands of complexity when undertaking KM: the multi-dimensionality of project management's (PM) success; the different perspectives of success amongst project stakeholders; the high rates of project failure and poor PM performance; and the temporary nature of the organization structures formed to manage projects. These issues form the backdrop of their chapter, in which the authors set out KM activities for managing knowledge through a project, from design and delivery, through to handover and closure. The chapter then focuses on how to deal with the tacit dimension of knowledge in PM, highlighting the importance of social networks and trust. It ends by reflecting on how future technological developments such as artificial intelligence or machine learning might contribute to KM in projects.

In their chapter on 'Best Practices in Knowledge Management: A Review of Contemporary Approaches in a Globalised World', Chapman and Macht point to the ambiguity and difficulty in defining what best practices actually mean. They note that there is little agreement around what actually constitutes a 'best practice', with less consensus around how firms can better reflect the best practices of their industry. The authors note, however, that there are a number of contexts in which best practices can be applied, plus many known methods. For example, KM can be conceived as a set of competencies; the extent to which managers can assemble and apply these helps firms focus on successful outcomes. Chapman and Macht also discuss the value of high-performance work systems (HPWS), which help to cultivate a number of desired competencies among employees, and the value of developing work systems around tacit knowledge in the supply chain. Here, the authors argue that the fundamental element of any HPWS is a high level of involvement by employees, and a high level of commitment from managers. Similarly, a

commitment to building best practices emphasized by different competencies starts with senior management who have powerful influence over middle management priorities. The chapter highlights several universal best practice approaches by Roy (2010) and Koelliker (2017). Some of these point to the importance of aligning KM practices to the strategic goals of the firm, the best practices related to locating the required experience and skills, and a robust idea of the knowledge base that needs to be created (among many others). Readers of this chapter should also refer to the chapter by Gherardi and Miele on the importance of a social perspective of knowledge in building best practice. The authors note that while many factors will influence the manner in which KM best practices unfold, based on current research, managers and practitioners have a number of guiding principles for developing best practices. The chapter also has a number of important examples of best practice and KM application.

In their chapter on 'A critical realist pathway to relevant and ethical research', Syed and Mingers offer a critical realist perspective on relevant and ethical research within the field of management. In particular, their chapter persuades management researchers who are concerned about the research-practice gap that by adopting a critical realist perspective towards knowledge, they may be better able to recognize and explain problems of relevance to organizations and that the adoption of critical realism brings with it an explicit ethical dimension that is currently denied by positivism and, at most implicit, in interpretivism.

Finally, Hislop, Murray, Shrestha, Syed and Mouzughi offer concluding thoughts in their chapter titled 'Knowledge Management: (Potential) Future Research Directions', in which they make some overarching comments regarding potential future research directions for the field of knowledge management. Acknowledging that doing so may be a subjective process, the authors present their perceptions of what they regard as important issues and topics that could facilitate the development of the field.

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Part I

Conceptual and Theoretical Foundations of Knowledge Management

2

The Domains of Intellectual Capital: An Integrative Discourse Across Perspectives

Peter A. Murray

Introduction

Intellectual capital (IC) has often been conceived as the sum of human capital (HC), organisational capital (OC) and social capital (SC) (Subramaniam and Youndt 2005: 451), while, in other studies, IC equals the sum of HC and structural capital (Bontis 2001: 45). Elsewhere, it is framed as knowledge that is created and stored in those three capital components, such that knowledge embedded in one component of IC can leverage the value of knowledge in the other components (Reed et al. 2006: 868). While many definitions exist, comprising multiple independent and dependent variables that create confusion in the literature, HC is the common denominator of IC where there is consensus related to its components: (1) knowledge, education and training, (2) expertise and abilities, and (3) behaviour and commitment (Martin-de-Castro 2014: 240). Previous literature enables the more prominent aspects of IC to be explained. Taking the lead from Subramaniam and Youndt (2005), originally conceived from Becker (1964) and Nelson and Winter (1982), HC is the knowledge, skills and abilities and other skills (KSAOs)—for example emotional intelligence—that represent individual-level attributes or individual human assets. Using as a foundation the resource-based view (RBV) (Barney 1991; Barney and Felin 2013; Peteraf and Barney 2003) and the micro-foundations literature (Coff and Kryscynski 2011; Felin 2012; Ployhart and Moliterno 2011), this chapter seeks better to understand how individuals'

P. A. Murray (✉)
School of Management and Enterprise, Faculty of Business, Education, Law and the Arts, University of Southern Queensland, Toowoomba, QLD, Australia

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knowledge in the form of KSAOs become firm-level human capital resources at the organisational level (OC), as a means to develop dynamic capabilities. By RBV, I mean determining which heterogeneous resource combinations in factor markets lead to competitive advantage. By micro-foundations, I mean the inseparability and importance of both individual and collective human capital resources (HCR) (Ployhart et al. 2014: 377), the complementarity of these resources (Barney and Felin 2013) and how, through the process of emergence, HCR become transformed and bundled, often via high-performance systems, into useful dynamic capabilities at the organisation level (Boxall and Macky 2007; Eisenhardt and Martin 2000; Felin 2012; Ployhart and Moliterno 2011).

An exploration of HC and HCR, however, cannot be undertaken without understanding organisational capital (OC). OC is defined as institutionalised knowledge that is codified and resides within and is utilised through databases, patents, manuals, structures, systems and processes (Subramaniam and Youndt 2005: 451). Yet it is also useful to think of OC as structural capital, that is, the processes and procedures that are created, and stored in, a firm's technology system and that speed the flow of knowledge through the organisation. While at one time knowledge may be stored and codified, which facilitates a feedback loop at different levels, at another it is rendered informative through the feed forward process between the individual, the group and the organisation (Bontis et al. 2002; Crossan et al. 1999). Some scholars suggest that the evolving stock of IC over time is dependent on knowledge management (Bontis et al. 2002: 440) and how this knowledge becomes transformed, leading to new innovations (Nandkumar and Arora 2012), the basis of which are mechanisms for creating, protecting and transferring knowledge (Argote and Ingram 2000; Hu and Randel 2014). Since organisations need to continuously respond to the environment though superior learning (Hedberg 1981; March 1991), OC must comprise a learning culture that understands (and can measure) how knowledge stocks change and can be transformed over time (Bontis et al. 2002; Murray 2002). The third component of IC is SC, or relational capital that is focused on the development of a complex set of interactions and networks, both internally and externally. The basis of this is obligations, expectations and trust (Coleman 1988), network ties (Granovetter 1973), and norms and shared values (Nahapiet and Ghoshal 1998). Principally, SC is about the 'mobilization of resources through a social structure [… and an] implicit set of available resources and ongoing relationships implemented through interactions among individuals or organisations'.

The synthesis of IC in the discrete forms described makes sense in research domains where it is possible to use precise measurement tools, and possibly in contexts where KSAOs might be generalised, such as within similar industries with similar isomorphic practices. However, it is more likely, given that significant differences exist in terms of what constitutes IC, that it will be difficult to measure how common inputs lead to competitive advantage in terms of achieving above average rents, that is, over and above firm resources, or above the marginal breakeven rate of near competitors within the firm's product markets. This is because, as I highlight in some detail below, there is little research that examines IC across different constructs, and is also due to the fact that time and space, as well as measurement constructs, often differ. Thus, it is difficult to grasp exactly what attributes are common to which approach. The relationships between the three constructs (human, organisation, and social capital) have been criticised in different ways. General criticism relates to the vagueness and breadth of definitions where different types of IC represent different kinds of knowledge assets (Martin-de-Castro 2014) and differences in human capital (Nyberg et al. 2014), which result in unclear measures that are difficult to generalise across organisations and industry contexts. Take, for instance, a specific HC skill. The latter must be accessible for unit-relevant purposes (Ployhart et al. 2014), which becomes challenging if the skills that a person possesses in one unit, for example selling skills, are not required in another unit—pointing to the existence of many different HC resources present across units. Moreover, the terms 'skills' and 'abilities' are often used interchangeably between different literatures, which conflicts with the psychology literature where skills and abilities are conceived as different constructs (Nyberg et al. 2014: 328; Wright et al. 2001).

Similarly, measuring IC on the basis of RBV alone suggests that this measure would be too broad, as many resource configurations are possible (Maritan and Peteraf 2011; Reed et al. 2006) and there are well-known time constraints related to trading resources in factor markets (Dierickx and Cool 1989). Following this line of thinking, many scholars measure performance that is underpinned by similar resource attributes leading to circular or tautological arguments often described as routines to learn routines (Eisenhardt and Martin 2000: 1107; Hsu and Wang 2012). At the OC level, despite recent studies of the relationship between the different IC components and performance, it is still unclear what role dynamic capabilities (DC) play, either those that develop within or across groups (Bridoux et al. 2017). For instance, we know that DC are described as 'organisational and strategic routines by which managers alter their resource base, acquire and shed resources, integrate them together, and recombine them, to generate new value-creating strategies'

(Eisenhardt and Martin 2000: 1107). But what is less clear is how these capabilities emerge from HCR.

Further, given the importance of trying to operationalise different IC components, are DCs the same thing as firm or unit-level HCR? Moreover, how are DCs operationalised in moderate or dynamic factor markets, given that firm performance should be the end goal of IC processes? Lastly, in nearly all prior studies, the effects of SC have been examined along traditional measures of external social capital (ESC)—capital related to building external social relationships (Coleman 1988; Granovetter 1973). However, it is valuable to study internal social capital (ISC) and ESC as both may lead to fungible and tradeable resources, depending on the context (Nahapiet and Ghoshal 1998; Reed et al. 2006). There are also many recent investigations of the relationship between ESC and performance, studied within a sociocentric paradigm where the focal actor is a collective (McElroy et al. 2006; Mu et al. 2008) as well as into the influence of SC on various forms of innovation, technology and local knowledge (Aribi and Dupouët 2015; Díez-Vial and Montoro-Sánchez 2014; Leal-Millán et al. 2016; Manning 2010). Thus, a potential opportunity for further study is to explore in more granular terms the effects of ISC and ESC on performance, how these relationships can be measured, and how they might transform organisations' existing stocks and flows of knowledge. For my purposes here, this relates to connecting discourses between these approaches. While these many issues cannot all be empirically addressed in a theoretical review, the discussion clarifies the theoretical linkages between the different IC constructs by developing a connecting discourse around IC variables. Several discourses and linkages between individual HC and unit-level HC, OC and SC are developed. To this end, my goals are twofold. First, the main aim is to develop an integrative discourse of the links between HC, HCR, OC and SC. The chapter explores how these components of IC are linked to competitive advantage. The second aim is to illustrate, through a process of emergence, how DCs are created by exploring the connecting discourses between the domains of IC knowledge.

This chapter is structured as follows. First, the discussion explores the first IC domain in HC and its connecting themes. Second, HCR are discussed within the context of the aggregation and accumulation of KSAOs from the HC level. This section goes into the question at some length, to outline how the processes of complementarity and emergence occur as a connecting discourse. Third, I consider how DCs are formulated from HCR and how knowledge is transformed at the OC level. The final part of the chapter explores the SC domain and the connecting themes. Here, the chapter develops a discourse between ISC and ESC and DCs by building on the idea that

it is problematic to measure SC on the basis of collapsing both internal and external SC. Overall, the chapter seeks to make a major contribution to the literature and addresses recent calls for more integration of the IC construct.

Conceptual Framework

The following discussions on HC build on recent research into the relationships between HC and HCR. The first basic tenet of these relationships is, broadly, that many individual attributes that one possesses are innate, representing some individual capabilities that already exist, as Felin (2012) suggests, and that these capabilities grow endogenously, reflecting latent possibility. Felin posits that the ability to do something, anything—whether fly, walk, create or think—is a function of the nature of an organism (2012: 286), such that while scholars are quick to study the environment and how its inputs effect subparts or organs, they often miss the endogenous factors that underlie capability or behaviour. Similarly, individuals are the product of their upbringing, schooling and education; they already possess multiple abilities and behaviours that are latent talents and often poorly matched to organisation needs (Barney and Felin 2013; Boxall and Macky 2009; Campbell et al. 2012). The second broad tenet is that individual-level KSAOs cannot be easily generalised to a wider set of homogenous capabilities that can be accumulated into firm- or unit-level competitive advantage, nor deployed to achieve greater strategic impact (Ployhart and Moliterno 2011; Wright et al. 2001). Following this line of thinking, we see that individual firm-specific skills valuable to a firm may not necessarily restrict the mobility of people between one firm and another, and collective skills are seldom homogenous (Nyberg et al. 2014). Ployhart and Moliterno suggest that 'researchers assume a relationship between individual KSAOs and unit-level performance but there is little theory to support this association' (2011: p. 2011). I now turn to a discussion of these relationships.

Individual-Level Human Capital

In a recent study of the relationships between firm-level knowledge and skills and general knowledge and skills, Campbell et al. (2012) contend that KSAOs have limited applicability outside a specific firm, since any HC generated will be valuable, rare and easily kept from rivals. This follows the RBV that the resources held by firms within an industry may be heterogeneous

and thus not readily transferable between firms (Barney 1991; Peteraf and Barney 2003). HC resources include the 'training, experience, judgement, intelligence, relationships and insight of individual managers and workers' (1991: 101) that are not easily replicated by other firms. However, this is not the case for general HC, referred to as worker skills, that might be more valuable outside the firm in question (Campbell et al. 2012: 377). For instance, the latter authors suggest that specific skills—such as the knowledge obtained from sending people on a training course—may make these skills less attractive to external firms who may require a different skill set dictated by their own firm-specific requirements. However, a worker may have many unused general skills that are innate, such as high-level problem solving skills, and which are not desired by her current employer but attractive to other organisations. This suggests that firms ought to focus on identifying all general and firm-specific skills and competencies that are attractive in labour markets. This perspective is consistent with other recent studies on high-performance human resource (HR) practices that influence employee attitudes, behaviours and competencies (Cohen 2015; Kehoe and Wright 2013; Shin and Konrad 2017). Moreover, firms should not generalise about how KSAOs might represent the sum of all individuals' skills, given that many of these will be firm-specific as well as general skills. Further, firm-specific HCR plus general skills influence the mobility of workers between firms, highlighting the importance of how organisations manage and treat their HC stock as complementary and related resources (Nyberg et al. 2014; Ployhart et al. 2014).

This observation is consistent with the meaning of complementarity in the strategy and micro-foundations literature, that is, the idea that the presence of one element of resource combinations in a system increases the value of other elements (Ennen and Richter 2010). Similarly, multiple complementarities of KSAOs are required to accomplish most tasks within a task environment that in itself can either be simple or complex (Barney and Felin 2013; Ployhart et al. 2014). For example, tasks on a production line may be relatively simple but if we asked a worker to perform multiple tasks as part of an assembly unit, further combinative or bundlings of skills may be required across assemblage tasks involving other workers. Barney and Felin note, however, that focusing on HC just at the individual level (whether in combinative or compilation forms) also misses the 'unique interactional and collective effects that are not only additive but emergent' (2013: 141). For instance, Ployhart et al. (2014: 384) suggest that KSAOs are not only interactive but also causally related, such as when highly stable KSAOs (such as cognitive ability) influence the more malleable KSAOs (such as job knowledge). Of course, at the individual

level, it would be valuable to try to recognise what all of those complementarities, interactive and collective skills are and how they might be consolidated as HCR.

Recent research of 32,000 HR professionals across the globe led to the development of nine competency domains that were deemed necessary for increased job performance. Some of these for example include HR technical expertise and relationship management, communication and global and cultural awareness, and ethical practice and business acumen (Cohen 2015: 209). The point is that organisations need to take stock of their suite of knowledge at the individual level, both specific and general KSAOs, the complementarities of those resources and how they emerge over time, and what contributions they make to developing a set of competency domains germane to ongoing performance. Managing the stocks of knowledge in this way also adds to the collective perceptions of employees, as revealed in recent studies where high-performance HR practice is positively related to affective commitment, organisational citizenship behaviour and intent to remain with the organisation (Kehoe and Wright 2013: 383). Here, and with a note of caution, it may be equally important to establish a clear line of sight between strategy and performance, and to foster integrative frameworks that support discourse in these areas. That is, strategic development in factor markets demands more than just an understanding of RBV on heterogeneous resources that lead to competitive advantage. People management practices and strategies manifest in organisational capabilities (or competencies), group competencies/norms and individual KSAOs, and are embodied in HC and SC and knowledge stocks and flows that collectively establish superior performance and/or competitive advantage (Buller and McEvoy 2012; Nyberg et al. 2014; see also Wright et al. 2001). These relationships invoke a more detailed review of firm- or unit-level resources.

Firm- or Unit-Level Resources and Organisational Capital

In a recent review of HCR by Ployhart et al. (2014), as well as a meta-review by Nyberg et al. (2014), a distinction can be made between individual-level and unit-level or firm HC resources. Nyberg et al. suggest that while 'KSAOs are unique constructs at the individual level, they manifest different types of KSAOs at the collective level' (2014: 321). The premise of these relationships is that scholars need to shift from thinking about HC as an individual-level

construct to the broader notion of HCR, given that different 'types' of HCR across organisations will have different unit-level performance outcomes. HCR then are a 'unit-level resource that is created from the emergence of individuals' knowledge, skills, abilities, and other characteristics' (Ployhart and Moliterno 2011: 127). Ployhart et al. (2014) suggest, however, that emergence occurs mainly across levels, for instance between departments in an organisation, whereas complementary resources can be present within the same unit and across levels. Complementarity exists in the aggregate not only in the formation of individual HC, and with the consistent application of HPWS that act as a lever to allow this to occur, but also in multiple complementarities that are required to complete more complex tasks. They consist of both causally related and interactive resources that aggregate at the unit or organisational level through social interaction, interdependence and influence.

Barney and Felin (2013: 147) contend that emergence leads to collective outcomes that are surprising and not necessarily reducible to different individuals. In much of what follows, I draw on the work of Barney (1986); Barney and Felin (2013) and Felin (2012) and Nyberg et al. (2014) by describing how HCR comprise complementarity, interaction, causality and the aggregation of HC resources within and across higher levels of firm or unit HCR in terms of resource accumulation. Here, and as a way forward, a synthesis of the strategy and change literature suggests that firm- or unit-level HCR acts as a stock of resources at the firm level for the development of DCs. To the extent that HCR represent a multitude of resources that are complementary and interactive (Ployhart et al. 2014), accumulative (Dierickx and Cool 1989), integrative and interdependent (Esienhardt and Martin 2000), reconfigured, coevolving and transitioning (Brown and Eisenhardt 1997), and enabled through composition and compilation (Ployhart and Moliterno 2011) among others, they are more likely to be a driver of competitive advantage in factor markets. Resources bundled in this way contribute to the formation of organisation-level DCs. I illustrate here that a combination of HCR leads to the establishment of structural capital. Structural capital refers to the structures, systems, processes and established routines embedded within the firm (e.g., Hsu and Wang 2012), which encompass the establishment of routines around high performance plus a compilation (rather than a composition) of DCs.

Both structural capital and DC comprise OC based on this review. Thus, I outline below how OC leads to competitive advantage depending on the environmental context. In terms of how, through more efficient use of OC resources, organisations influence firm performance and competitive

advantage, I use DC as the lever to explain the way firms build competitive advantage in factor markets. Dynamic capabilities as outlined are similar to how Helfat and Peteraf describe DCs as 'the ability of an organization to perform a coordinated set of tasks, utilizing organisational resources, for the purposes of achieving a particular end result' (2003: 999). Elsewhere, Helfat et al. (2007: 1) suggest that capabilities relate to the capacity of an organisation to purposefully create, extend or modify its resource base, in much the same way that Stahle (2008: 165) implies that capabilities are a learned pattern of collective activity through which the organisation systematically generates and modifies its operation routines in pursuit of improved efficiencies, possibly because of labour market frictions that lead to more investment in HC (Molloy and Barney 2015). However, given how DC is implemented, the working definition described by Eisenhardt and Martin (2000) is preferred, that is, it constitutes "well-known processes such as alliancing product development, and strategic decision making. … their value for competitive advantage lies in their ability to alter the resource base, create, integrate, recombine, and release resources" (16). The basis of OC—encapsulating structural and dynamic capability—relies on the accumulation of resources in HCR to achieve competitive advantage as those resources aggregate (Barney and Felin 2013) and, over time, become embedded in structural capital. A number of examples from extant research illustrate the connecting discourse.

First, factor markets can be described in terms of 'where firms buy and sell the resources necessary to implement their strategies' (Barney 1986) to achieve above-average rents through heterogeneous resources that create a resource-based advantage (Barney 1991). This occurs in two ways: (1) where a firm has superior information about the value of the resource a priori, or (2) where the firm is lucky (Maritan and Peteraf 2011: 1375). Later, researchers countered these original claims by proposing that resource accumulation processes provide another way to achieve competitive advantage other than resources acquired through superior information. Here, the purpose is not to build on the strategy literature debate about these two positions (e.g., see Dierickx and Cool 1989; Helfat and Peteraf 2003; Pacheco-de-Almeida and Zemsky 2007) but rather to demonstrate through illustrative examples how DC is the driver that helps organisations to achieve competitive advantage. The accumulation of resources occurs in multiple ways, the basis of which is micro-foundations that are aggregated into HCR. Out of these individual and unit-level HC resources, individuals aggregate into teams, groups and organisations in non-linear ways (Barney and Felin 2013: 149; see also Bridoux et al. 2017) and often in novel fashion (Felin 2012; Nyberg et al. 2014). Aggregate resources in turn, and over time, build unique DC based on established

deep-seated organisational capabilities that may yield a sustained competitive position, especially where they relate to training and investments in HC (Eisenhardt and Martin 2000; Helfat and Martin 2015; Riley et al. 2017).

Brown and Eisenhardt (1997), for instance, in a study of the high-velocity computer industry characteristic of blurred market boundaries in dynamic markets, demonstrate how firms built organisational structures and systems based on continuous change. In the more successful of these, capabilities were built around probing routines (capabilities), including those related to a vision of themselves as 'creators of the fastest software on earth' (1997: 16). Furthermore, new product inquiries by new product developers and engineers became product options that were useful in new markets. Here, creators were aggregating their combined bundle of KSAOs to form strong interactive capabilities that related to emergence often in novel and exciting ways. Interdependence within the unit was important, shielding the successful firm from market vulnerabilities and access to only one type of market probe, since new futures in high-velocity markets arrive quickly.

Similarly, in evolving from the present to the future, and by avoiding the prospect of leaving future projects to arrive suddenly, complementarities related to transitioning product portfolios that 'created an almost seamless switch from one project to the next' (1997: 21) became a familiar routine. Less successful were those who relied on structural capital only—in other words, those with structures, systems and processes that were not flexible enough, thereby creating stop/start scenarios, and which lacked well-defined responsibilities or a structured development process and so product profitability and project schedules were unclear (Brown and Eisenhardt 1997: 11). For successful firms, out of the aggregation of design and organisational imperatives there was evidence of both compilation and cross-level emergence that combined distinct KSAOs with the composition of homogenous and similar KSAOs (Ployhart et al. 2014: 387). This often related to training, for instance probing routines, that directly influenced financial performance in respect of new project efficiencies. These findings are similar to those of a recent study into the relationship between whether effective investments in general training can benefit firms financially (Riley et al. 2017: 1896), where 'firms that engage in superior training efforts do receive significant financial returns, and the variance in these financial returns is affected by the firms' investments in the complementary assets of R&D [research and development], physical capital, and advertising'.

In much extant research, therefore, there is an explicit link between modifying current capabilities as investments in HC and creating new capabilities for knowledge creation. However, these capabilities arise from the unit's HCR,

in the above examples, that is the capacity of the organisation to build multiple complementarities between product innovation, and cultural and HCR. Ahuja and Lampert (2001) indicate that when an organisation becomes more exposed to new knowledge domains, for example probing, exploring, training, testing out new project and product ideas as described earlier, then existing knowledge becomes less reliable and attractive. The opposite of this is seen in how HCR are used by firms in more predictable linear situations. In moderately dynamic contexts, for instance, where change occurs frequently but along predictable and linear paths, a firm's structures, systems and procedures reinforce existing knowledge such that the knowledge stock creates 'a path-dependent trajectory of reinforced knowledge' (Subramaniam and Youndt 2005: 453; see also Greenwood and Hinings 1996). Here, capabilities may lose their dynamic features through isomorphic product and service replication as other likeminded organisations adopt institutionalised workplace structures that conform to their organisation environment, largely because firms in this situation seek legitimacy through their structures and systems being similar to those of others (Di Maggio and Powell 1983). An illustrative example can be found in the banking industry, as banks seek similar OC gains, such as in lending practices, as other banks (Reed et al. 2006).

In other studies, complementarities and emergence occur in ways that reveal interdependence between the environment and factor markets, not only interdependence inside the firm. For instance, in a study of how contingencies in the environment influence the relative importance of a firm's capabilities, particularly related to technical and marketing aspects, it is found that the 'external supply of technology diminishes the value of a capability that enables firms to produce a substitute (internal technical capability) that enhances the value of a capability that enables it to produce a complement (marketing capability)' as a source of competitive advantage (Nandkumar and Arora 2012: 248).

Similarly, coevolving capabilities arise out of efforts to capture synergy within HCR in different parts of the organisation. In cross-functional teams, for instance, it is common to share ideas and contexts so that transmitted information and knowledge is easily accessed among team members (Hu and Randel 2014); tacit knowledge shared among team members might later coevolve into quite radical innovations (Perez-Luno et al. 2011). In this situation, complementarities evolve through team processes where emergence leads to shared values and innovations over time (Brideoux et al. 2017). However, DCs also coevolve as explicit linkages between a given firm and knowledge sources that are located externally. For example, in a study by Henderson and Cockburn (1994), external linkages were critical to connect

pharmaceutical firms to new knowledge creation processes. Mu et al. (2008) found that networking through interaction complementarities provided continuous learning between the networking firms, providing timely access to new information and resources. Taken together, DCs are created through complementarities that aggregate up to different levels within and across the organisation, as well as externally. Furthermore, emergence occurs from accessing HCR pools of stocks of knowledge (not always successfully), leading to a complex process of interactions, causality, compilation and composition, as well as coevolving and interdependent relationships.

The foregoing discussion suggests that it is possible to posit a connecting discourse between HCR and DC, since what is occurring is a transformation of existing stocks of knowledge from the HCR pool of knowledge into DCs that help a firm to achieve sustained competitive advantage. Overall, the connecting discourse relates to how firms draw from their HCR to develop DCs. Given that the focus thus far, however, has been more about DC, there is also a connecting interchange of activities between HCR and strategic HR management practices or high-performance work systems (HPWS). For the purposes of my analysis, I have located these within the structural capital domain of IC. I do so because they comprise systems and practices that tend to be embedded and institutionalised. For example, in the meta-review of the resource-based view of HC, Nyberg et al. note that there is an implied causal link between HR policies and practices and unit-level performance (2014: 324). In labelling these connections as antecedent HRM policies, these scholars find that many articles spend little time discussing the links between a unit's HCR and unit- or firm-level performance.

While HRM policies, systems and practices lie more broadly at the OC level, specific practices and systems, such as HPWS, increase the empowerment of workers and enhance their skills (Boxall and Macky 2007). For instance, in previous studies of production workers, work redesign led to workers being able to solve technical problems, providing opportunities for learning through high-involvement routines and greater empowerment. As noted by Boxall and Macky (2007: 265), HPWS—also called high-involvement work systems—lead to drivers of workplace performance, including, but not limited to, renewal in technology (technology work processes), performance and commitment incentives (enhanced commitments to work smarter) and management capability and support (improved investments in management development at all levels). These scholars also discuss complementary practices and the importance of 'bundling', which they see as 'the combination of practices into a bundle rather than individual practices, which

shapes the pattern of interactions between and among managers and employees' (Boxall and Macky 2009: 5).

However, high-performance practices differ significantly within and across firms (Kehoe and Wright 2013; Wright and Boswell 2002) and in different industry settings such as small and medium-sized enterprises (as with larger organisations). High performance work systems (HPWS) also differ within internal organisational capital components, such as practices that define top management team cultures and middle management resistance. Similarly, environmental constraints (customers and competitors) influence the adoption of HPWS in medium-sized firms (Torre and Solari 2012). However, HPWS also create a level of expectancy that strengthens the effort–performance link and instrumentality that in turn strengthens the performance–reward link in recent research (Shin and Konrad 2017). Similarly, HPWS enhance motivation, productivity, ability and opportunity for employees (2017: 977). Shin and Konrad find, for instance, that there is a positive feedback between HPWS and productivity where an increase in one resulted in an increase in the other, such that the beneficial effects of HPWS may be difficult for competitors to imitate (2017: 988). Much of the HPWS literature is also grounded in the RBV approach that improvements or investments in individual human assets lead to higher unit and managerial influence (Wright et al. 1994; 2001), where SHRM policies shape what employees learn, which in turn effects the unit or firm stock of HCR (Boxall and Purcell 2003; Nyberg et al. 2014). In relating the valuable approaches of HPWS to the HCR, it is possible that SHRM practices contribute to the establishment of multiple resource complementarities which lead to DCs that will be embedded at the OC level.

A Discourse Between Human Capital, Human Capital Resources and Dynamic Capability

Table 2.1 illustrates some examples of the process of emergence related to new product development between HC, HCR and DCs at the organisational level which form part of the IC domains of knowledge. At the HC level, these comprise the KSAOs described earlier. Here, skills and abilities may be deemed similar in prior research, which accounts for why many researchers use 'skills' as a measure of performance (Martin-de-Castro 2014; Nyberg et al. 2014). However, I see skills as a 'doing' function, as seen in skills related to managing a project team, or skill at being able to motivate a team towards

shared values. Similarly, an ability is something more innate, such as a latent ability or general skill that a person possesses and which the firm has not developed (Campbell et al. 2012; Felin 2012) but that might also be developed through training to develop a particular competency or increased ability in problem-solving and higher-order thinking (Murray et al. 2009). While knowledge will consist of current knowledge held at the individual level, this existing knowledge will need to be challenged (Espedal 2008) such that any new knowledge acquired by all individuals is aggregated at HCR level. At HCR level, these are the complementarities that comprise multiple skills, bundles of HC resources that will eventually lead to an emerging set of DCs. Each firm will use HCR differently depending on the level of innovation evident—in other words, the capacity to transform HCR bundles into DCs, such as through a culture of learning (Nyberg et al. 2014). The success of this transformation will also depend on how the firm addresses its existing stocks of knowledge embedded within its structural capital.

Firms will most likely build on their existing stock of knowledge through the complementarity process of HCR in developing DCs. Thus, in column 3 in Table 2.1, the emergence of actual capability reflects both a firm's structural capital and dynamic capability, since each firm needs to rely on its existing structures and systems by exploiting their knowledge base (Bontis et al. 2002; March 1991). As noted earlier, DCs reflect the emergence and complementarity of resources that are interactive, accumulative, integrative, interdependent, reconfigured, coevolving and transitioning (Brown and Eisenhardt 1997; Dierickx and Cool 1989; Esienhardt and Martin 2000; Ployhart et al. 2014), and these will most likely reflect new learning routines that challenge the existing stocks of knowledge (Crossan et al. 1999; Espedal 2008). Most notably, these resource combinations will be different across firms and will depend on how each firm transforms HCR into useable and tradeable DCs. Taken together, and in terms of new product development, the HC stock of knowledge informs and leads to HCR's stock of new product knowledge. This in turn, through the process of emergence (Barney and Felin 2013), leads to sets of DC that relate to the capacity of a firm to transform its HCR into the new knowledge stock of capabilities which creates competitive advantage. As Felin (2012: 288) acknowledges, capabilities, whether in the economic or social domain, rely on the aggregation, interaction and coordination of numerous individuals.

The other key component of intellectual capital is social capital. I now turn to a discussion of the key principles of SC and how its domain influences a firm's DCs.

Table 2.1 A discourse between HC, HCR and DC

1 Human Capital (HC)	2 Human Capital Resources (HCR) at the unit or firm level	3 Dynamic Capabilities (DCs) (formed through the process of emergence at the OC level)
Knowledge: Prior experience, building a new product, working in a project team, knowledge of other units, leading new projects Skills: Project completion, keeping the team on track, meeting budget, managing a project team; motivates people towards shared values. Abilities: Communicating, interacting, teamwork, motivating, connecting, leading, planning, solving problems. Other: Understands competing demands, is able to coordinate between top management priorities and lower-level functions; understands environmental complexity.	- Combined skills of all people working in the unit; complementarity of skills within the unit; - accumulative and compilation of knowledge across the unit aggregated up; - reconfigured, coevolving, transitioning, integrative abilities, such as people learning from others, new knowledge through increased interaction, increased value of heterogeneity; excitement and level of commitment created at the unit level; level of team cooperation in cross-level teams; - culture of learning within the firm; - level of leadership provided as a seamless integration from top to bottom (aggregation of leader skills).	Existing knowledge stock: - How a firm uses its HPWS to transform existing knowledge and the quality of firm training; - rate of knowledge dissemination across the firm; - degree to which current structures and systems guide the new product development process; - difficult to imitate current structural capital in the firm as a source of competitive advantage; - superior service outlets. New knowledge stock: - New product development process unique to the firm; - culture converted into learning and innovating routines; - rate of acquiring new product knowledge and absorptive capacity; - technological capability and know-how; - speed to market of new products and rate of new product success; - superior management information system around product development; - Highly skilled and knowledgeable workers, such as knowledge of actual innovation process and ability to improvise, create, drive and develop product innovation routines.

Social Capital

The purpose of this section is to explore several discourses of SC, namely internal social capital (ISC) and external social capital (ESC) and to explore their connecting themes. Sociologists such as Burt (1992), Coleman (1988) and Granovetter (1973) indicate many points of interconnection where social capital is 'defined by its function which is embedded or inheres in social relations between and among actors where the SC becomes a resource for persons' (Granovetter 1973: S98). The social relations produced become useful resources for exchange purposes. Social capital is defined as the 'goodwill available to individuals or groups […] its source lies in the structure and content of the actor's social relations […] its effects flow from the information, influence, and solidarity it makes available to the actor' (Adler and Kwon 2002: 23). Internal social structure is concerned with actors' own internal structure and the linkages among individuals or groups within the collective (rather than the collective itself) that establish cohesiveness, such as through bonding (Adler and Kwon 2002), and integrative and interaction routines within a group (Crossan et al. 1999; Nyberg et al. 2014). Fukuyama (1995: 10) describe SC as 'the ability of people to work together for common purposes in groups and organisations'. That is, capital associated with internal relationships (Reed et al. 2006) or ISC. ESC refers to the collective behaviour of a firm whose actions are influenced by its external linkages (Adler and Kwon 2002), that is, capital associated with establishing all external relationships (Bontis 1998; Manning 2010), and networks among individuals (Coleman 1988) that underpins the importance of building social networks. One side of SC is described thus in terms of *sociocentric* theories, where the 'focal actor is a collective […] where social capital is found in the internal linkages that characterize structures and give them cohesiveness' (McElroy et al. 2006: 128; see also Adler and Kwon 2000) but also in all external structures that relate to social function (Coleman 1988). An important notion for the sociocentric approach is that of a close-knit community that provides similarity, safety and predictability (Kianto and Waajakoski 2010). The other side is described as an *egocentric* approach (Bourdieu 1986), that is, in terms of the 'benefits that an individual actor's relationships bring to this particular actor, and how these benefits influence the actor's relative position compared with other actors within the same social structure' (Kianto and Waajakoski 2010: 6). Similarly, the structural dimension of SC concerns the frequency of interaction (Scott 1991) and the density within a network, while the cognitive dimension concerns how effective collaboration occurs

through shared mental models and narratives (Kianto and Waajakoski 2010; Nahapiet and Ghoshal 1998). In much of what follows, I discuss SC within the domains of ISC and ESC, which encompass many of these broader approaches.

According to Coleman (1988), the basis of SC is obligations, expectations and trustworthiness where reciprocal favours build up a large number of credit slips, some of which remain unused but where, over time, obligations will be repaid. A degree of trustworthiness is thus built into the social environment (Coleman 1988: S102) on the basis of the exchange relationships established. Nahapiet and Ghoshal (1998) illustrate how the components of SC relate to structural capital (not the capital described earlier within OC but rather as part of social relations), relational embeddedness and cognitive capital. For instance, structural capital is the overall pattern of connections between actors, while relational embeddedness concerns personal relationships that people have developed with each other; 'cognitive capital refers to those resources providing shared representation, interpretations, and systems of meaning' (1998: 244). These views augment Coleman's attention to the establishment of information channels through social relations that constitute a form of SC (1988: S104). Similarly, where effective norms facilitate some actions, they also constrain others, for instance where an organisation policy might encourage external networks to be established on the one hand but where policy dictates that these must be run by two or more departments that are likely to be affected. This suggests that in the development of these components, the ability to create and exploit SC will relate to differences in norms between firms, including differences in performance—such as problems of power, where in the initial quest to invest more in value creation where synergistic benefits are expected, the fear of opportunism and competition for value pushes partners to outpower each other (Panico 2016: 1647). By comparison, Granovetter explores relationships as represented by strong or weak ties, a key part of building SC networks. For instance, a smaller number of ties between A and B (strong ties) who are firm friends, even while A might be connected to C (weak ties) through B, will be reflected in the 'combination of the amount of time, the emotional intensity, the intimacy, and the reciprocal services which characterise the tie' (1973: 1361). Importantly, strong ties between two or more people will become less frequent as people become more familiar with what each offers in the relationship over a longer period of time. In reality, however, people and firms have many ties, which are mostly weak but connected through bridges linking central actors. Here, all bridges become weak ties (1973: 1364). The idea is that weak ties produce structural holes arising from the configuration of links between actors (or lack thereof);

however, weak ties might also mean that actors have greater flexibility and a wider access to information (Kianto and Waajakoski 2010).

There is also an important discourse between ISC and ESC. ISC will mostly result through interaction and emergence inside the firm as people with close relationships (e.g., people within the same department) build relationships over time. These relationships and interactions will also occur across departments, since, as discussed earlier, HCR relates to complementarities, as with strong interaction ties built through internal relationships such as teams. For instance, while trust contributes to tacit knowledge-sharing in many previous studies (Lin 2007; Yang and Farn 2009), and to the fostering of personal relationships (Nahapiet and Ghoshal 1998), recent research by Hu and Randel (2014) finds that cognitive social capital is not associated at all with ESC. Cognitive social capital, such as shared values and shared language, however, is highly conducive to tacit knowledge-sharing within teams as a basis for building ISC and extrinsic incentives are found to be positively related to both explicit and tacit knowledge-sharing (2014: 234). Yet the establishment of ESC has its downsides. While weak ties will rely on a local bridge in different sectors, for example areas within the networked community that represent either a long or short path that connects an external actor to a focal actor, such external relationships need be nurtured and maintained because social bonds have to be periodically renewed and reconfirmed (Adler and Kwon 2002: 22). Similarly, firms within the network might be excluded from the benefits of SC, while commitment and cooperation highlight key interaction complementarities if they can be established. Further, the motivation for donors to support recipients in the absence of immediate returns means that firms need to build a sense of shared identity and dyadic mutual social exchange (2002: 25) if ESC is to be successfully negotiated.

The opposite of this is the upsides that create opportunity in ESC situations, such as the leveraging of network contacts that enable firms to act together (Panico 2016). For example, in situations where local bridges create more and shorter paths, a firm—as the focal actor—might have many close suppliers with shorter bridge connections compared to other suppliers who have longer bridge ties. However, this raises another concern based on the time it takes for ESC to develop, given that although weak ties and bridging networks might be many, they seldom develop quickly and, in some cases, take years (Granovetter 1973) and can just as easily be disbanded (Adler and Kwon 2002). Nahapiet and Ghoshal note, for instance, that the concept of embedding fundamentally means the binding of social relations in time and space (1998: 257), where transactions are consummated over a period (Coleman 1990: 91). Here, it seems highly unlikely that ESC can be consid-

ered at a snapshot in time and space as representing a reliable indicator of performance. Rather, I contend that ESC based on this research is more likely to represent a moderating variable between an independent and dependant variable (such as X and Y), affecting the relationships between HC and HCR, and OC—both structural capital and dynamic capital—as outlined earlier. However, this is not to discount previous SC research. For instance, SC has been found to be an individual-level antecedent for career success, job search outcomes and reduced turnover rates (Burt 1992; Krackhardt and Hanson 1993; Nyberg et al. 2014). More recently, in a study linking customer capital (substituted for relational and social capital), Leal-Millán et al. (2016: 458) find that relationship-learning enables firms to compete better and satisfy stakeholders by structuring and reconfiguring resources that influence both green innovation performance and customer capital. Aribi and Dupouët (2015), in a study of the absorptive capacity of firms to acquire new knowledge in the form of bringing new products to the market, find that SC is best suited for knowledge accumulation, maintenance and circulation, whereas organisational capital is a tool for coordination and cooperation (2015: 1002) confirming much of the previous discussion. Fang et al. (2011: 129), use an interesting theoretical model to examine how socialisation factors, namely organisational tactics and newcomer proactivity—such as relationship-building and positive framing—contribute positively to newcomer adjustment and subsequent career success. Much of this research is very valuable in understanding the role of SC in contributing to firm performance. However, taken together, these SC relationships often conflate ISC and ESC, which are applied at a moment in time and highlight the complexity of the SC domain within the overall IC landscape of knowledge.

The proclivity for building ESC to be attractive to stakeholders also relates to how tasks are structured within a network. Here, the value of SC depends on how well the tasks to be undertaken within the network fit with company goals (Adler and Kwon 2002; Krackhardt and Hanson 1993). Task contingencies help explain whether strong or weak ties are more valuable (2002: 34), where strong ties lead to more cost-effective transfers of complex information and weak ties a search for more codifiable information (Hansen 1998). Similarly, tasks can be both highly structured and unstructured in studies of sociology examining worker participation on the basis of race or some other factor (Alexander et al. 2009; Chizek et al. 2003; Walker et al. 2014). Highly structured tasks are allied with more homogenous groups and those with a clearly articulated problem and solution with less external participatory opportunity. On the other hand, unstructured or open-structured tasks create many additional opportunities for participation (Walker et al. 2014), as such

problem-solving benefits from greater diversity. So, task structure and participation relate to how HCR is organised in terms of ISC within a firm's OC.

Interestingly, in a study by Reed et al. (2006: 884) of the banking industry, HC is revealed as influential when ISC is low in personal banks, that is, the sharing of information through interaction is ineffective, or similarly when OC is low—meaning that information-processing infrastructure is inadequate (described earlier as structural capital). Conversely, however, strong ties in the commercial sector through ESC are evident between the bank and the business community because of the need to sell banking services. This research suggests that for ESC, although many weak ties establish more opportunities for connection, strong ties are necessary within certain contexts and are more cost effective. On the other hand, and in relation to ISC, it may indicate that HCR is less effective in establishing complementarity and interaction—the emergence of ideas for sharing information for instance—quite possibly because some firms (banks in this instance) are less effective in managing their HCR. I now turn to how different discourses across perspectives might be combined, the outputs of which become DCs at the organisational level.

A Discourse Between Social Capital and Dynamic Capabilities

Table 2.2 illustrates some examples of the process of emergence related to ISC, ESC and DCs at the organisational level which form part of the intellectual capital domains of knowledge. The SC components in the table are consistent with scholarly understanding of both ISC and ESC and reflect the discussion thus far. Table 2.2 also illustrates the factors to consider in establishing a competitive advantage in the application of social capital. Therefore, the goal of this section is to identify connecting discourses between each of the principle contributors of ISC, ESC and DCs.

In Table 2.2, the establishment of ISC in column 1 is dependent on how the KSAOs of individuals are aggregated and compiled, the degree of interdependence established between these resources in HCR, how these are then combined and reconfigured and the degree to which these are available for immediate action (Nyberg et al. 2014). Similarly, ESC depends on resource complementarity and the aggregation of ESC resources. In both columns 1 and 2, the components of ISC and ESC need to be transformed into DCs through the emergence process. The success of the emergence process will vary across firms and the degree of commitment to building DCs. For

Table 2.2 A discourse between SC and DC

Internal social capital within HCR 1	External social capital within HCR 2	DCs (formed through the process of emergence at the OC level) 3
- Structure and content of internal actors' social relations and close relationships; - how internal actors are linked across departments and foster cooperation; - degree of cohesiveness and bonding within a group; - evidence of interactive and team integrative skills; - working together towards common goals within groups and within the firm generally; - individuals inside the firm create social networks; - ability to establish internal group norms; - ability of individuals to share their tacit knowledge; - how extrinsic incentives relate to explicit and tacit knowledge; - learning interventions that enable individuals to develop ISC skills.	- Pattern of connection between external actors; - establishment of information channels; - capacity and willingness to invest in value creation in the network; - time, emotional intensity, intimacy and reciprocity; - leverage networked opportunities from resource complementarity; - commitment, obligation and trust common; - donor support in the absence of immediate returns; - shorter bridge connections and strong ties; - maintaining connections over time and space; - relationship learning established; - task–structure fit.	ISC - Evidence of a strong learning culture related to building ISC; - strong linkage evident in cross-functional teams and cohesiveness; - sharing of goals and norms central across groups; - firm uses HPWS to train individuals how to build social networks; HPWS is a DC for building ISC; - sharing of tacit and explicit knowledge common across individuals and groups; ESC - Structure of embedded relationships that are difficult to imitate; - creation of information channels that supplement existing firm channels and create new network opportunities, making imitation difficult; - strong commitment, reciprocity and relationships built on trust commonplace; - strong bonding of ties that lessen inter-firm rivalry over opportunistic value creation behaviour; - evident that partners are willing to invest over time and space, creating a dynamic capability of interdependence as resources shared are aggregated up; - strong evidence of commitment shown by all partners; - establishment of strong network ties and flexibility towards structured or unstructured task arrangements; - strong evidence of relationship learning.

instance, in column 3, the DC will be evidenced by the ability of a firm to create, extend or modify its resource base by utilising organisational resources to achieve a particular result (Helfat 1997), such as by establishing HPWS and creating a culture of learning. Furthermore, the discourse changes to represent what the firm is actually doing by building strong linkages, creating strong ties and information channels, and by building the structure of embedded relationships over time. This reinforces the idea noted by many scholars that although KSAOs may be present, they may not be being used effectively by a firm at the organisational level (Boxall and Macky 2007; Campbell et al. 2012; Nyberg et al. 2014; Ployhart et al. 2014). The resource stocks listed in column 3 as DCs are thus formulated both from the heterogeneous differences that can be established plus the accumulation of resources (Barney 1991; Maritan and Peteraf 2011). However, while Table 2.2 might suggest a seamless integration and transformation of resources at the DC level, this is not always the case, as noted earlier, since all firms learn and acquire knowledge at different rates and both ISC and ESC measurements will be dissimilar, depending on the many contexts in which study constructs are used.

For instance, in a study of 21 managers from large start-up software corporations in China with turnover exceeding 10 million Chinese RMB, Mu et al. (2008) explore whether firm innovation can be leveraged from the accumulated SC embedded within inter-firm relationships, as well as the extent to which networks share knowledge and their underlying mechanisms. In what is mainly a study of ESC, these scholars discover that the 'identification of the process through which social capital facilitates knowledge flow and consequently innovation enhances the understanding of firms' strategic behaviour' (2008: 95). Reciprocal trust needs to be high within these interdependent relationships, enabling the flow of knowledge from one partner to another, thus confirming these resources as illustrated in Table 2.2. From the networking relationships, mainly through strong ties, they note the importance of continuous learning and colearning, creativity and idea exchange, as well as network relationships that are both path-dependent and path-creative, and difficult for other firms to copy, on the basis that they are socially embedded, complex and idiosyncratic. Such strong links thus enhance innovation within a firm.

Similarly, in building on the general idea that ESC is linked to performance, Kianto and Waajakoski (2010) in a study of 143 Finnish firms, explore whether intra-organisational SC—structural capital, relational social capital and cognitive social capital—increase organisational growth. They find that only extended external SC—the extent to which key partner relationships allow the firm to access new partners or customers—is related to organisational growth (2010: 11), and that ISC is negatively associated with growth,

especially for firms that are not part of inter-organisational networks. ISC is associated with growth only for firms within such a network. These scholars note that the type of SC within a firm is contingent on its market, suggesting that stable markets (moderate dynamic markets described earlier) might be best in situations of bonding and of developing close, predictable and harmonious collaborations (2010: 12), which supports the general conception of SC trustworthiness, reciprocity and strong ties (Coleman 1988; Granovetter 1973). The opposite of this situation is arm's-length collaboration through weak ties and structural lacunae, characterised by unpredictable and rapid nonlinear change, especially in situations where inter-organisational collaboration is approached in a disorganised and limited way. The latter recommendation from Kianto and Waajakoski (2010), and to an extent the ESC links established by Mu et al. (2008), confirm recent research by Panico (2016) that greater synergistic benefits push partners to invest more in the creation of value. However, since it is difficult then for partners to terminate, they tend to increase the competition for value, leading to a situation where partners race to overpower each other (2016: 1659). The risks of ESC thus confirm what Adler and Kwon (2002) suggest are the downsides of external collaboration, where social bonds and high-trust relationships have to be nurtured and maintained.

The point is that SC links to performance in the above examples are thus highly dependent on idiosyncratic environments, and the degree to which firms can build trusting relationships in establishing ESC collaborations. ISC may also lead to inertia in firms when it has poor links to organisational performance (Reed et al. 2006). These studies bring into question the connecting discourse between the different SC domains; they may be interconnected but it may be misleading to suggest that antecedents (sets of independent variables) can be easily identified. Moreover, it is highly likely that ISC will be more visible in strongly established external networks that are relatively stable and not in rapidly changing cycle markets. Similarly, ISC is firmly embedded within HCR and a culture that values the building of trust, a zest for acquiring knowledge and high-interaction KSAOs that aggregate into a culture of exploration outside the firm. However, HCR of combined SC will be firm specific and are not readily associated with a general list of SC skills (such as those illustrated in Table 2.2) that can easily be transformed into dynamic capabilities. ESC, by comparison, is established not so much from weak ties but rather derives from strong network ties of established and trustworthy relationships, a situation which is in stark contrast to that found in the network ties literature. The latter appears to be consistent in many studies underlined in this chapter and as seen by the strong relationships

established. Accordingly, in establishing the connecting discourse between ISC, ESC and DC, the complexity of relationships related need to be carefully considered by both scholars and practitioners.

Discussion and Conclusion

This chapter set out to achieve two broad aims. One was to develop an integrative discourse of the links between human capital, human capital resources, organisational capital and social capital. Out of these, OC was divided into structural capital and DCs, whereas SC comprised both ISC and ESC. These relationships have been explored at some length. The second aim was to illustrate, through a process of emergence, how DCs are created by exploring connecting discourses between the main domains of knowledge of intellectual capital. Both aims were explored within the context of the extant literature and from recent meta-reviews. For instance, the analysis built on recent work by Nyberg et al. (2014) and Ployhart et al. (2014) on the HC stock and its link to competitive advantage and the RBV logic (Barney 1991). Similarly, the discussions focused on the key IC domains by exploring a broad literature, highlighting many connecting discourses. Tables 2.1 and 2.2 illustrated how these discourses emerge into the creation of DCs. By exploring the DC literature, I also described how competitive advantage could be achieved both through heterogeneous and accumulated resources (Maritan and Peteraf 2011) and how these aggregate up at unit-level HCR through the process of emergence, and transform into DCs (Barney and Felin 2013; Eisenhardt and Martin 2000; Felin 2012; Nyberg et al. 2014). However, since there is some confusion about whether HCR are to be conceived of at the organisation level—what scholars also refer to as unit-level—I argued that HCR lead to the establishment of structural capital, since they are no longer individual-level resources but rather are bundled as a pool of knowledge at HCR level and embedded in structures, systems, processes and policies so that they can be converted into DCs (Brown and Eisenhardt 1997; Riley et al. 2017). These bundles might ordinarily be transformed through HPWS that help the firm develop new knowledge stock at the OC level. The discussion noted that structural capital and DCs together comprise OC, that is, structural capital representing the existing stock of knowledge and DCs underpinned by new stocks of knowledge as a result of the transformation process between HCR and DC at the OC level. A review of the literature indicated that HC and HCR are not beneficial unless a firm can transform

HCR into DC through a process of emergence (Felin 2012) and unless those resources are accessible (Nyberg et al. 2014; Ployhart et al. 2014).

The discourse of connection in Table 2.1 showed how a firm linked its KSAOs to the compilation of HCR. The KSAOs consist of both firm-specific and general skills, with many firms unfamiliar with how the general skills of employees are also attractive to rival firms (Campbell et al. 2012). The discussion noted the importance of HPWS to enable the transformation of HCR into accessible resources. At HCR level, human resources accumulate through the complementarity process, and through the bundling and compilation of resources. However, since each firm is different, how resources are aggregated up to the next level is context specific, depending on how firms use their current structural capital and how they renew this through more efficient use of HCR. Poor use of HCR would suggest that firms will struggle to convert key resources into the DCs that create competitive advantage (Boxall and Macky 2009; Kehoe and Wright 2013). The illustrative example in Table 2.1 related to new product development routines building on an earlier discussion of DCs in projects (Brown and Eisenhardt 1997). The connecting discourse is that HCR needs to be converted into DCs which reflect a process of emergence in terms of how resources are reconfigured, accumulated and recombined, and which then help release other resources that are integrative and interdependent, complimentary and interactive, coevolving and transitional (Eisenhardt and Martin 2000; Ployhart et al. 2014; Ployhart and Moliterno 2011). The connecting discourse pertains to how each knowledge domain leads to the next. Furthermore, it reflects how well any firm can identify these stocks of knowledge and transform them into dynamic capabilities.

In relation to Table 2.2, firm behaviour will be influenced by a function of both ISC and ESC working together (Adler and Kwon 2002). And similar to Table 2.1, both ISC and ESC resources reside within HCR. The extent to which these can be used depends of how these lists of SC potential are realised—in other words, the extent to which a firm can transform its existing stocks of knowledge plus new knowledge into realisable DCs. Taking this one step further, while different approaches to exploring SC relate to performance (e.g., Nahapiet and Ghoshal 1998; Reed et al. 2006; Subramaniam and Youndt 2005), they also raise important measurement concerns noted by Martin-de-Castro (2014), largely due to the idiosyncratic context adopted. Apprehensions relate to the heterogeneity of contextual settings, such as the selection of populations and samples within a single industry. SC relationships, along with HC, HCR and OC of IC, have led to more recent scholarly attempts to define these relationships within multidimensional models that offer integrated frameworks of the different constructs

(Cohen 2015; Nyberg et al. 2014; Ployhart et al. 2014) and thus offer potential solutions. However, as noted in the introduction to this chapter, SC can also represent a confusing set of variables. Some of these may be antecedents and some end-points or outcomes. For instance, there is extant research that measures the degree to which external capital can be created from the many linkages between and across firms and how this leads to innovation (Mu et al. 2008), and how SC and socialisation factors lead to career success (Fang et al. 2011) and partner relationships within an alliance in which SC is the basis for the creation of value influenced by power relationships (Panico 2016). Furthermore, research indicates that ESC is crucial within certain contexts for influencing outcomes in banking arrangements (Reed et al. 2006), as well as how relationship capital (or SC) influences performance by establishing long-term relationships, among others. Similar to the other IC domains, it is less clear whether ESC is an antecedent, a moderating or mediating variable, a dependent variable, or an outcome. Given that it takes time to build ESC relationships, as discussed earlier, future research might explore ESC as a moderating or mediating variable. For example, given the time involved in establishing bridging relationships, whether weak or strong (Nahapiet and Ghoshal 1998), the idea that strong embedded relationships already exist within HCR is highly problematic. Similarly, information channels will often take years to develop (Adler and Kwon 2002), while trust-dependent relationships, reciprocity and value creation (among other factors) are characteristics of strong and successful networks. In seeking to measure SC, therefore, there may be a need to develop two distinct constructs that measure different things, rather than combining ISC and ESC into one construct.

In summing up, both Table 2.1 and 2.2 represent a list of connecting discourses. The value of these connections lies in how one domain of knowledge informs and builds on the other. For instance, at the HC level of KSAOs, these will reside in individuals. The connecting discourse is how the firm develops these in ways that translate and accumulate into the complementarity of resources at HCR level. Simply listing HC variables will be of little use to HR practitioners, for instance. What will be more important is the recognition of how the training functions extend the KSAOs so that at HCR level more value is created that can be accessed. Based on the literature, it is the bundling of these resources that becomes attractive. In the HCR domain of knowledge, resources will reside in systems, processes, policies and procedures, not just individuals, since skills will need to be recorded for future use and accumulated knowledge and ability assessed for unit-level performance. Collectively, this represents the absorptive capacity of the firm, its ability to

recognise new knowledge such as external information and apply it; yet an evolving form of knowledge accumulation embodied as DC in different forms of learning is applied (Cohen and Levinthal 1990; Crossan et al. 1999; Sun and Anderson 2008). The discourse between HCR and DC will thus depend on how HPWS, or a particular HR intervention, such as a change intervention, may act as an enabler between HCR and DC. The DC in turn will lead to competitive advantage if it is able to create an advantage in factor markets on the basis of heterogeneity and accumulation.

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3

Critical Evaluation of Nonaka's SECI Model

Marion Kahrens and Dieter H. Früauff

Introduction

Since the 1990s, the theoretical and empirical study of knowledge creation in organisations has revealed that knowledge and the capability to create and utilise it is one of the most important sources of a company's sustainable competitive advantage. Organisational knowledge creation is the process of making available and amplifying knowledge created by individuals and connecting it with the knowledge management system. The theory of knowledge creation in organisations explains the differences between firms as a result of successful implementation and application of the dynamic process of knowledge creation through a synthesis of thinking and the actions of individuals. The theory of organisational knowledge creation, first presented by Nonaka (1991), is a paradigm for managing the dynamic aspects of organisational knowledge creation processes. Its central theme is the SECI (socialisation, externalisation, combination and internalisation) model as a knowledge creation process, framed as a continuous dialogue between tacit and explicit knowledge. Meanwhile, his is the most influential and widely recognised theory in the knowledge management domain. As it has developed since 1990, it has broadened in scope and is now linked to a huge range of topics, such as

M. Kahrens (✉)
European College of Business and Management, London, UK

D. H. Früauff
Fraport AG, Frankfurt, Germany

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leadership styles, organisational forms, cultural aspects and organisational learning.

This chapter gives a comprehensive introduction of Nonaka's SECI model as the core of his theory which remained relatively constant and unchanged, while Nonaka's thoughts on knowledge creation have evolved. Furthermore, the knowledge creation theory is explained, while the SECI model is reviewed from several perspectives and critically evaluated regarding its practical implications. The example of the implementation of the SECI model in a German airport illustrates how it can be put into practice.

Theoretical Development of the SECI Knowledge Creation Process

Tacit and Explicit Knowledge: The Foundation

While the theory of organisation is dominated by a paradigm that implies organisation to be a system that processes information or solves problems, the organisational knowledge creation theory defines knowledge based on three assumptions. First, knowledge is a justified true belief of individuals (Nonaka 1994). Second, knowledge is the actuality of skilful action and/or the potential of creating situations to enable these actions. Third, knowledge is both explicit and tacit along a continuum (Nonaka and von Krogh 2009).

The basic concept of organisational knowledge creation describes the nature of information and knowledge as a continual dialogue between explicit and tacit knowledge which drives the creation of new ideas and concepts (Nonaka 1994; Nonaka et al. 2008). Ideas are formed in the minds of individuals, but interaction between individuals typically plays a critical role in developing these ideas. While these communities of interaction span departmental and organisational boundaries, they build a further dimension of knowledge creation, which is associated with social interaction between individuals that share and develop knowledge. Nonaka and Toyama (2003) conceptualise knowledge creation as a dialectical process, in which contradictions are synthesised through dynamic interactions between individuals, the organisation and the environment. Knowledge is created in a spiral that goes through antithetical concepts such as order and chaos, micro and macro, part and whole, mind and body, tacit and explicit, self and other, and deduction and induction. Knowledge is created through interactions between human beings and social structures. Actions and interactions

within the environment create and enlarge knowledge through the process of conversion of tacit and explicit knowledge (Nonaka and von Krogh 2009; Nonaka and Toyama 2003).

Knowledge that is uttered, formulated in sentences, and captured in drawings and writings is considered explicit. Explicit knowledge has a universal character, supporting the capacity to act across contexts. Explicit knowledge can be expressed in formal and systematic language, which exists in the form of data, specifications, manuals and documents. It can be processed, transmitted and stored (Nonaka et al. 2000a). In contrast to explicit knowledge, tacit knowledge is highly personal and not easy to formulise. Knowledge tied to the senses, tactile experiences, movement skills, intuition, unarticulated mental models or implicit rules of thumb is considered tacit. Tacit knowledge is rooted in personal action, procedures, routines, commitments, ideals, values and emotions (Nonaka 1991; Nonaka et al. 2000a, b). It can be accessible through consciousness if it leans towards the explicit end of the continuum. Hislop (2013) summarises the main differences between tacit and explicit knowledge (see Table 3.1).

Explicit knowledge can be shared at low cost among individuals and it loses its explicitness where people move to act on this knowledge. Doing so, individuals acquire tacit knowledge through action, interaction and practice, which has elements of explicit knowledge. The acquisition of tacit and explicit knowledge and their conversion is an important topic in the theory of organisational knowledge creation (Nonaka and von Krogh 2009). The concept of knowledge conversion explains the interaction of tacit and explicit knowledge along the knowledge continuum and its correlation with the creation of knowledge assets in organisations.

To understand how organisations create knowledge dynamically, Nonaka et al. (2000a) propose a model of knowledge creation consisting of three parts:

Table 3.1 The characteristics of tacit and explicit knowledge (adapted from Hislop 2013)

Tacit Knowledge is	Inexpressible in a codifiable form
	Subjective
	Personal
	Context specific
	Difficult to share
Explicit Knowledge is	Codifiable
	Objective
	Impersonal
	Context dependent
	Easy to share

the process of knowledge creation (SECI process), the shared context of knowledge creation (the Ba), and the inputs and outputs (knowledge assets) of the knowledge creation.

SECI: The Process of Knowledge Creation Through Conversion

The cyclic SECI model, covering socialisation, externalisation, combination and internalisation, has been developed by Nonaka (1994) based on Japanese companies' experiences. This model can be described as initial research into the transfer of knowledge management theories in company applications. The creation of knowledge is described as a dialogue between tacit and explicit knowledge and can be visualised in Nonaka's knowledge creation spiral, which represents the four modes of knowledge creation. The modes of knowledge creation are explained as four conversions of knowledge (Fig. 3.1):

- tacit in tacit knowledge as knowledge-sharing through experiences;
- tacit in explicit knowledge as knowledge articulation through dialogues;
- explicit in explicit knowledge as the systematisation and application of knowledge;
- explicit in tacit knowledge as learning and knowledge acquisition in practice.

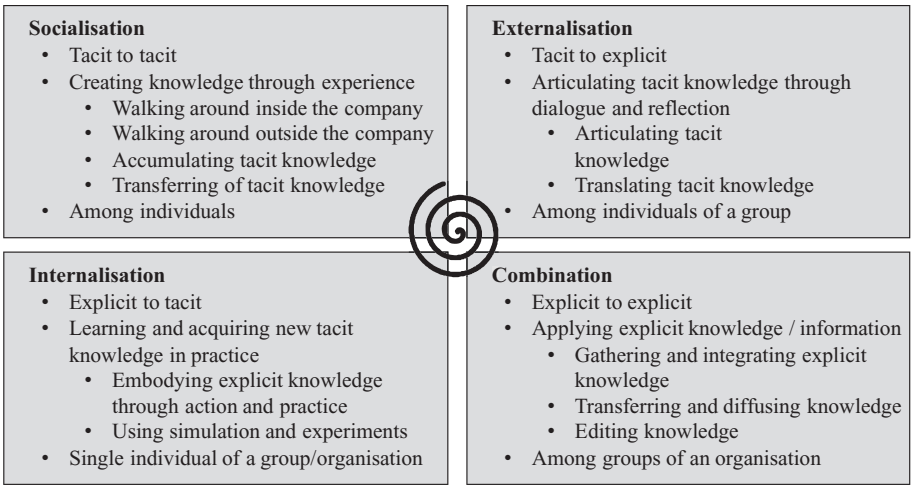

Fig. 3.1 The SECI model of knowledge creation (adapted from Nonaka and Toyama 2003)

According to the knowledge creation spiral, knowledge can be created by socialisation, externalisation, combination and internalisation. It takes place in groups or with individuals and includes the conversion of tacit and explicit knowledge (Nonaka et al. 2008).

Socialisation

Knowledge creation starts with the process of converting new tacit knowledge through shared experiences of social interaction. This occurs through the day-to-day interaction of individuals. While tacit knowledge is difficult to formulise and often time and space specific, it is often acquired through shared experience. The traditional apprenticeship is an example of this type of knowledge conversion, where apprentices learn the tacit knowledge needed in their specific organisational environment by listening or viewing while spending time with colleagues and through hands-on experiences. The shared knowledge in this case relates to customers, suppliers or competitors. Therefore, routines are part of tacit knowledge acquisition because they are developed through close interaction over time (Nonaka and Toyama 2003).

In the socialisation process, individuals' subjective knowledge is accumulated, shared and socially justified by coalescing and expanding it. For example, a mentor in an organisation who has a good deal of tacit knowledge guides the mentee in learning it themselves through practice (Nonaka and von Krogh 2009). This enables mentees to absorb knowledge in their social environment through action and perception. The dichotomy between the environment and the organisation can be synthesised as members of the organisation accumulate and share the tacit knowledge in the environment through their practical action within the organisation (Nonaka and Toyama 2003).

Externalisation

Externalisation is the process in which tacit knowledge is transformed into explicit knowledge. Externalisation can be regarded as an important step in the acquisition of new organisational knowledge. It is a process of mutual interaction, which is most crucial regarding the creation of new knowledge. In the externalisation process, individuals' subjective knowledge is accumulated, shared and socially justified by bringing it together and expanding the knowledge base of a group. Knowledge is the capacity to act based on explicit and

tacit elements. Enhancing this capacity means making use of existing or new tacit knowledge to create explicit knowledge (Nonaka and von Krogh 2009).

The dialogue between individuals within groups is an effective method to make tacit knowledge explicit, so that it can be shared by others to become the basis of new knowledge such as that embodied in concepts, images and written documents. To make a hidden concept or mechanism explicit, the sequential use of analogies and models is one of the basic methods. It is vital here to understand that actors seek to detach themselves from routines by active exposure to a context that enables them to see the inherent contradictions in a process (Nonaka and Toyama 2003).

Combination

Combination is the knowledge conversion mode that covers the combining and organising of different types of explicit knowledge collected from inside or outside the organisation. The combination process aims to combine, edit or process the explicit knowledge to form more complex and systematic explicit knowledge. The new explicit knowledge is then disseminated among the members of the organisation. The use of computerised communication networks and large-scale databases support and facilitate knowledge conversion. The breakdown of concepts is an example of how to conduct the conversion mode combination. Breaking down a concept, such as a corporate vision, into operational business targets or product portfolios leads to explicit knowledge. In the combination process, contradictions are solved through logical reasoning (Nonaka and Toyama 2003).

The combination process requires an exchange mechanism such as meetings of groups within the organisation. The complexity increases in the practical execution of this conversion process the more parties and groups are involved. In particular, cross-departmental exchanges in the combination process require an effective exchange mechanism, such as a moderated meeting or discussion forum.

Internalisation

Internalisation is the conversion from explicit knowledge to tacit knowledge. While socialisation is a never-ending process of generating knowledge among stakeholders through communication, the created and shared explicit knowledge throughout an organisation is converted into tacit knowledge by

individuals in practice, when knowledge is used in practical situations and becomes manifest in new routines. Here, explicit knowledge, such as product or service concepts, manufacturing or administrative procedures has to be kept active through practice and reflection. For example, training programmes can help trainees to understand an organisation. By reading documents or manuals, such as job descriptions, and by reflecting upon them, trainees can internalise the explicit knowledge of such documents. Further effective methods of knowledge conversion from explicit in tacit knowledge are simulations or experiments. Pragmatic learning concepts such as training-on-the-job or learning-by-doing are effective methods to test and modify explicit knowledge. Internalised knowledge affects the individual and the synthesis of individuals in their specific environment (Nonaka and Toyama 2003).

Since the beginning of the model's development, a broad academic discussion has arisen, mainly covering the distinctions between the different conversion processes, the relationship between the explicit and tacit levels and its possibilities related to cultural differences. The adaption and application of the SECI model is under continuous discussion and development (von Krogh et al. 2012; Lee and Kelkar 2013; Nezafati et al. 2009; Tee and Lee 2013).

The four conversion modes of tacit in tacit, tacit in explicit, explicit in explicit and explicit reversed in the form of new tacit knowledge constitute an approach to support the exchange and creation of knowledge. The SECI model is widely accepted but varying contents and perceptions regarding the importance of particular aspects of the knowledge creation model exist, such as cultural aspects, the practical implications of the transformation of knowledge and the role of management.

KM practitioners soon learnt that much important knowledge is not explicit. Only the discussion, probing, reflection and conversion of tacit knowledge can bring out valuable explicit knowledge. The twofold needs of business and practice is to have a solution in the knowledge management framework regarding knowledge creation that recognises:

- knowledge is not an object;
- knowledge exists in interaction;
- knowledge requires an interpretative framework;
- knowledge itself is linked and created through action;
- knowledge includes the two categories—explicit and tacit.

Therefore, knowledge management frameworks in organisations should include these different organisational elements. This would lead to a pragmatic

and integrating approach. From the 1990s to the 2010s, the discussion regarding the increasing complexity in business and business processes underlines an approach towards a well-balanced knowledge management by integrating different views such as those of employees, customers, suppliers, the organisation and the environment at large.

A crucial step within the cyclic logic at play here entails the interactions of people with their individualism and with the company as a powerful body, an organisational rule-setter with inherent culture. Taking into account the fact that only the conversion of explicit to explicit knowledge can be controlled on a rational basis, all other stages are governed by the extension of uncontrollable tacit knowledge. Therefore, these stages face the challenge of completeness and incompleteness related to the actions and content of business processes.

Organisational Knowledge Creation

Organisational Knowledge

Organisational knowledge creation differs from individual knowledge creation. It takes place when all four conversion modes of knowledge creation are organisationally managed to form a continual cycle. First, the socialisation process requires the interaction of individuals, such as a team or a field of interaction, which facilitates the sharing of members' experiences and perspectives. Second, the externalisation process is triggered by successive rounds of meaningful dialogues, in which team members are enabled to articulate their perspectives and reveal hidden tacit knowledge. Third, any concept formed by teams is combined with existing or external knowledge in the combination process, where the coordination of team members and the organisation of documentation is required. This process can be characterised as an iterative procedure of trial and error, where concepts are articulated and developed until they emerge in a concrete form. And fourth, this experimentation triggers the internalisation process of learning-by-doing. The interactions between tacit knowledge and explicit knowledge tend to become larger in scale and faster as more actors in and around the organisation become involved. Therefore, organisational knowledge creation can be seen as an upward spiral process, starting at the individual level and moving up to the collective group level, then to the organisational or inter-organisational level (Nonaka 1994).

Due to the fact that knowledge creation is not a natural act and tacit knowledge, held in the minds of individuals, is not usually readily given or received

without incentives, individual and organisational barriers, such as the reluctance to share knowledge, need to be overcome. Therefore, organisational influencing factors such as the physical and virtual space (the so-called Ba (see the next section)), the leadership and organisational control, the culture and the working style of the organisation have to be determined to enable knowledge creation to happen efficiently (Magnier-Watanabe et al. 2011).

Ba: The Shared Context of Knowledge Creation

Organisational knowledge requires a context to be created, because knowledge cannot be shared or created in a vacuum. Without context, knowledge remains purely as information. The context here is not limited to a fixed set of surrounding conditions, but it describes a wide process of which the cognition of individuals is part (Magnier-Watanabe et al. 2011; Nonaka et al. 2008). Organisational knowledge creation requires a contextualised space, whether it is mental (experiences, values, ideas), physical (office, book or product) or virtual (groupware, e-mail, intranet or databases). Nonaka et al. (2000a) introduce the concept of the physical and virtual space—referred to as 'Ba' (which roughly means place). This Japanese word refers not necessarily to just a physical space but a specific time and place. The concept underlines the necessity of interaction among individuals and their environment to collect the applied knowledge of the context in a certain time and space (Nonaka et al. 2000a, b, 2006). From a practical point of view, the adoption and implementation of the SECI model requires the development of common practices justified by the organisation members to achieve a set of organisational routines for knowledge creation (Hong 2012).

First, this emphasises the construction of a field for knowledge creation, such as building self-organising teams to bring personal knowledge into a social context, within which it can be amplified, personal perspectives articulated and conflicts are resolved in the formulation of concepts. In business organisations, the field for interaction is often provided in the form of an autonomous team made of members coming from a variety of functional departments. It is a cost-driven matter for an organisation to decide how to establish the field of interaction, due to the cost of maintenance—especially in case of face-to-face interactions. According to observations of successful project teams in Japanese firms, the team size should not exceed 10 and 30 individuals, because the direct interactions between the group members decrease when the group size increases. Second, four to five core members are

recommended for the team; they constitute focus points, assuring appropriate exchange of information within the cross-functional team.

Third, the span of the field of interaction is not confined to the boundaries of a single organisation. Self-organising teams can be initiated at several organisational levels of corporations, assuring the exchange of concepts up to the top management. Furthermore, it is a process that frequently makes extensive use of knowledge in the environment, especially that of customers and suppliers. Sharing tacit knowledge with suppliers or customers in communities of practice through co-experience plays a critical role in creating new knowledge (Nonaka and Toyama 2005; Sapir et al. 2016). From the management perspective, the key issue is the decision about the creation of 'Ba' within the organisation related to the company-specific culture, the number of fields of interaction and the selection of team members with the right mix of specific knowledge and capabilities. This will be discussed in detail in Chap. 4. Table 3.2 summarises the importance and applicability of 'Ba' related to the SECI model.

Collective and virtual interactions require the support of information technology. In all phases of the SECI process, the support of information technology is very useful. Due to the fast-paced nature and globalisation of work, information technology such as e-mail, smartphone apps, instant messaging, net-meetings and video conferencing have the potential to bridge distance and time to enable quasi-real person-to-person socialisation. Social media, wikis, blogs, e-forums, e-learning platforms and information repositories are examples of the traditional use of stored and retrieved knowledge (Lee and Kelkar 2013).

Table 3.2 Types of Ba

Modes of knowledge creation	Types of Ba—Description
Socialisation	Individual and face-to-face interaction Sharing of experiences, feelings and mental models
Externalisation	Collective and face-to-face interaction Converting mental models into common terms, articulating new knowledge
Combination	Collective and virtual interaction Transmitting of new knowledge by information technology in virtual collaborative environments
Internalisation	Individual and virtual interaction Embodying new knowledge from virtual media, manuals or simulation programmes

Knowledge Assets: The Input and Output of Knowledge Creation

Knowledge assets are the input and output of the knowledge-creating process through dialogues and practices under the different types of Ba conditions in the organisation such as physical and virtual space and common practices. Knowledge assets are intangible, specific to the company and can change dynamically. The value of knowledge assets can be realised when they are not only built but used within the organisation. Typical knowledge assets are the organisational know-how, patents, technologies or brands. Moreover, the definition of organisational knowledge also includes the know-how to create knowledge and the organisational capability to innovate. Organisational knowledge is a source of the future value of the firm. Knowledge assets also include the social capital that is shared in the organisation. One of the most important knowledge assets is the creative routines of the company's evolutionary process, which contain continuous self-renewals (Nonaka and Toyama 2005).

The development and accumulation of knowledge is a critical factor for the strategic management of the internationalisation process, because knowledge is considered a critical resource for the international performance not just of large multinational companies but also for small and medium-sized enterprises. The knowledge stock of a firm and the associated knowledge creation and learning processes influence the international performance of the firm in many ways (Denicolai et al. 2014).

Having the four modes of knowledge conversion in mind (tacit to tacit, tacit to explicit, explicit to explicit and explicit to tacit), it becomes clear that several types of firm-specific knowledge will be created through the different phases of the SECI model. Nonaka et al. (2000b) propose a categorisation of knowledge assets to achieve a systematic basis for the recognition, handling or management as well as the storage of the specific knowledge in the company (Fig. 3.2).

Experiential knowledge assets are the group tacit knowledge that is built through shared, hands-on experiences among organisational members, and/or between organisational members and customers, suppliers or affiliated firms. Conceptual knowledge assets are explicit knowledge based on the concepts held by customers and organisational members. They have tangible forms such as brand identities, product concepts/designs or explicit statements. Systemic knowledge assets, such as explicitly stated technologies or product specifications and documented information, can be legally protected. Routine knowledge assets are the tacit knowledge that is embedded in the

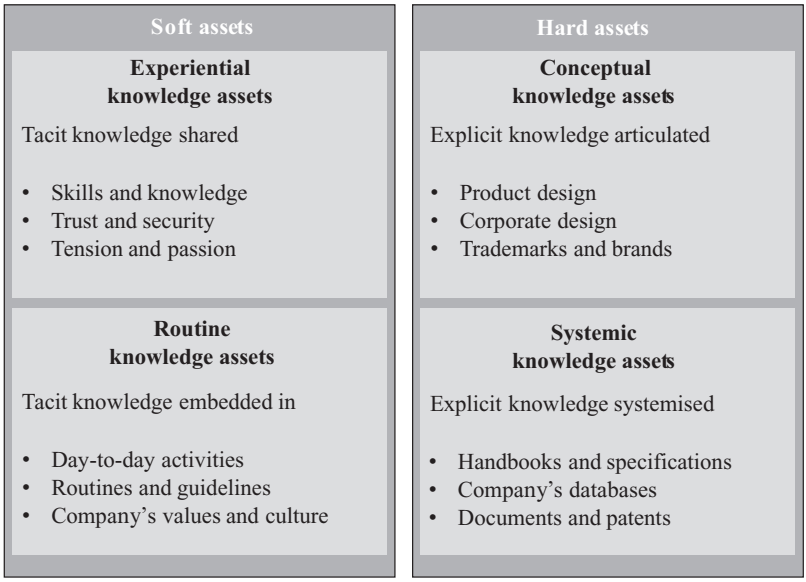

Fig. 3.2 Categories of knowledge assets

actions and practices of the organisation (Nonaka and Toyama 2005; Nonaka et al. 2000b).

Nowadays, research on knowledge assets categorises them into two camps: hard and soft assets. Hard knowledge assets include information technology and other knowledge management tools that enable the storage of and access to explicit knowledge. Soft knowledge assets cover organisational values, trust and routines (von Krogh et al. 2012).

To summarise, the major components of the knowledge creation process described are illustrated in Fig. 3.3. The framework of the knowledge creation process includes the contextualised place of knowledge creation, the Ba, the SECI model as the knowledge creation process itself and the knowledge assets as the input and output of the process.

Extensions of the SECI Model

Organisational Culture

Despite its popularity, the SECI model is challenged, especially concerning cultural aspects (as in the country-specific culture which determines the organisational culture). In the past, the SECI model has been criticised because its authors promote the model as universal, without questioning the

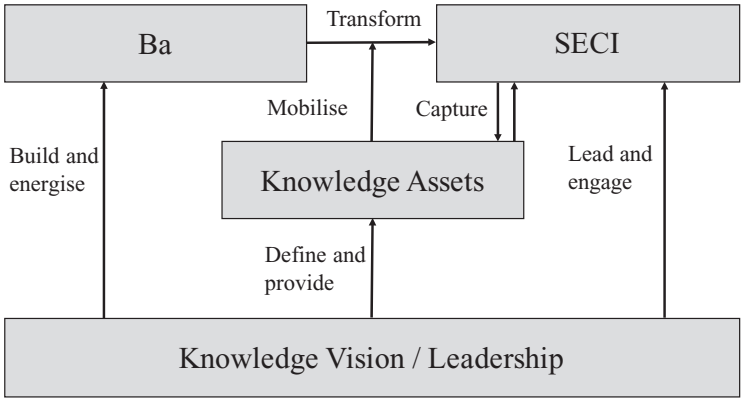

Fig. 3.3 Leading the knowledge creation process

cultural limits of its applicability. Organisational culture is described as a system of shared meanings held by organisation members. It determines the willingness to share knowledge and is enabled by strong personal affiliation with and commitment to the organisation (internal sharing of knowledge). Additionally, external sharing of knowledge is facilitated by network of partners and close interrelation between companies. Both internal and external sharing of knowledge characterise the Japanese culture and are claimed to be distinctively Japanese (Andreeva and Ikhilchik 2011). Since 1991, when Nonaka published on the concept of the knowledge creation company for the first time, a huge amount of research has been published which examines the applicability of the SECI model in several firms, in many countries and across all continents. These studies reveal that the SECI model can be applied in several industries, in different types and sizes of organisations as well as (to a broad extent) in different cultural settings (Andreeva and Ikhilchik 2011; von Krogh et al. 2012).

The company-specific organisational culture allows its members not only to understand the context and meanings of the knowledge being shared but serves as a sense-making and control mechanism that guides the attitudes and behaviours of employees. Thus, it determines, to a large extent, how members interact with one another. An open culture encourages discussion, communication and knowledge-sharing, while an organisational culture that fuels suspicion and power struggle will be limited in the free sharing and exchange of knowledge (Ho 2009; Magnier-Watanabe et al. 2011). Hong (2012) summarises that the core behavioural assumptions of the knowledge creation model of SECI—such as collectivistic orientation, active engagement in reflective learning and a strong desire for continuous improvement—are cul-

turally embedded in Japanese companies. Any attempt to adopt the SECI model needs to recognise and overcome cultural discrepancies (see table 3.3). Since the knowledge creation theory is investigated in practice, it is emphasised that the actors involved in the knowledge creation process take up the active agency of spreading, adapting, localising and legitimising the knowledge processes in their organisations. Based on this view, the SECI model serves the objective of actors involved, who are endowed with liberty and power to develop shared interpretations in the local context and materialise them into actions (Hong 2012).

Taking cultural discrepancies into account, it becomes clear that an effective and successful application and implementation of the knowledge creation process, with its components, the SECI model (knowledge conversion), Ba and knowledge assets, is impacted by strong leadership and the supportive function of the management.

Knowledge Leadership

Leadership, is defined as the process of influencing others to understand and agree about what needs to be done and how to do it, as well the process of facilitating collective efforts to accomplish shared objectives. Leadership is an organisational driver, which defines first the vision and values of the organisations and second how organisational members realise them. Concerning the knowledge creation process, leadership affects the two variables: motivation, which directs individuals towards goals; and opportunity, the extent to which a situation is conducive to achieving a desired outcome. Leadership determines this by defining the knowledge vision regarding what kind of knowledge is sought and created (Al Saifi et al. 2016; Magnier-Watanabe et al. 2011).

While knowledge is created through interaction, leadership requires active commitment from all the members of the organisation, not just from a few elites. For such leadership to be effective, the discipline has to be shared by the broader membership. This offers the required dynamic between strategy development and its application. For knowledge leadership to work, the mechanism of middle-up-down is the key. In such a process, middle managers break down the vision or objective into concrete concepts or plans, they build Ba, and lead dialogues and practices (Nonaka and Toyama 2005; Nonaka et al. 2006).

According to Nonaka et al. (2006), leadership plays various roles in the knowledge creation process, such as

Table 3.3 Cultural assumptions of Nonaka's knowledge creation model

Behavioural patterns	Underlying assumptions	Japanese values	Examples of cultural similarities and differences
Socialisation			
Engage in day-to-day social interactions Observations, intuition and direct experience	Strong desire to identify and interact with others Mobilising people to actions	High collectivism Large power distance	Applicability in China and Arab world, because networking is a traditional and widespread practice External sharing of tacit knowledge is limited in Chinese cultural context, because networks are concentrated inside departments, rather than between departments or organisations Russian organisations tend to be inherently hostile to knowledge-sharing Western companies with knowledge accessible and friendly culture tend to apply socialisation effectively
Externalisation			
Convert abstract ideas into concrete forms of information Demonstration, comparison and experimentation	Strong motivation for reducing ambiguities through feedback seeking Being assertive and determined in coping with uncertainties	High uncertainty avoidance Masculinity	Externalisation in Chinese organisations evolves the same way as in Japanese firms Limitations in the applicability in the Arab world Less efficient in western companies due to pressure from shareholders Moderately low external control in Russian organisations supports externalisation
Combination			

(*continued*)

Table 3.3 (continued)

Behavioural patterns	Underlying assumptions	Japanese values	Examples of cultural similarities and differences
Exchange ideas and thoughts with co-workers Accumulation, reorganisation and evaluation	Value the creation and sharing of joint resources Energising people and connecting them to dialogues	High collectivism Large power distance	Family spirit in Arab businesses supports combination Less efficient in Chinese companies because of concentrated authorities and decision-making Applicability is limited in Russia, because employees show low commitment to their organisations and the intensity of networking with external partners is low Western incentive systems motivate employees to cooperate in order to get rewards from knowledge creation, knowledge-sharing and cross-department cooperation
Internalisation			
Receive and digest others' ideas for one's own use Embodiment, reflection in action	Willing to open up for perspectives and thinking by reflection Striving for continuous improvement and advancement	High uncertainty avoidance Masculinity	Application in western and Arab firms is given considering job-rotation and learning-by-doing as a tool Significant aversion to taking actions that have a significant risk in the cultural context of China hinders internalisation Attitude of wanting to avoid mistakes hinders the delegation of responsibilities in the internalisation mode of Russian firms

- providing knowledge vision (managerial mindset);
- developing and promoting the sharing of knowledge assets;
- creating and connecting Ba;
- role-modelling and empowerment; and
- enabling and promoting the continuous spiral of knowledge creation.

The knowledge vision is a set of shared beliefs about how to interact to attain a future state, focusing on the knowledge to be created that goes beyond the existing boundaries of the products, the organisational structure and the markets. Through personal aspirations and collective sense-making, leaders develop an image of a possible and desirable future state of the organisation. These knowledge visions and objectives have to be accepted and shared by organisation members. Leaders then have to build, maintain and connect Ba by providing physical space such as meeting rooms, cyberspace such as a computer network, or mental space such as common goals, and they must promote interactions. Forming a task force is a typical example of the building of Ba, and includes the selection of the right mix of people to participate. Leaders have to know the situation in terms of how members of the organisation are interacting with each other and with external environments. Additionally, leaders have to supply necessary conditions such as autonomy, creative chaos, redundancy and commitment to facilitate the interactions among various participants (von Krogh et al. 2012; Nonaka and Toyama 2005).

To examine how leadership determines the knowledge creation process in organisations, it is not sufficient just to define the management level of responsibility and the attributes of knowledge leadership. The present research examines with a broader view whether different leadership styles adapt the SECI model and the types of knowledge differently. In particular, the two extreme poles of distributed and central leadership, and their impacts on successful application of the SECI model, are analysed (Table 3.4).

Table 3.4 Dimensions of leadership in knowledge creation (adapted from von Krogh 2012)

	Centralised leadership	Distributed leadership
Leadership	Autocratic rules	Participative management
Collaboration	Planned	Spontaneous
Guidance	Directed	Intuitive
Process	Regulating practice	Formalising practice
Authority	Stable	Fluid
Skill set	Lead or follow	Lead and follow
Development	Selection of skills	Diffusion of skills

Organisational Learning

The SECI model can provide guidance for designing learning environments and activities for the knowledge creation process. It has been criticised because it does not address whether the understanding of team members involved is deepened in the process of socialisation, externalisation, combination and internalisation in regard to organisational learning (Tee and Lee 2013).

Tee and Lee (2013) combine the SECI model with a conducive Ba and a problem-based learning approach to stimulate knowledge conversion and to deepen the understanding of students in the educational sector. Three major implications can be revealed from their research. Nonaka's knowledge creation theory provides a guide to design the necessary conditions (Ba) to stimulate knowledge creation processes that are grounded on developing real understanding. The purposeful use of a problem-based learning approach seems to provide the necessary heuristics to drive participants towards understanding, rather than just relying on coincidental trial and error. This at least presents the SECI model as a promising basis for the design of learning activities and learning environments (Tee and Lee 2013).

Nevertheless, the examination of a relation between the SECI model and organisational learning is currently under research. While some researchers examine the applicability of the SECI model in experiential learning environments, the application of the SECI model in the online and virtual learning environments is being investigated to gauge the relationship between learning management systems and the SECI model. It indicates that knowledge creation occurs and the knowledge creation process also takes place in e-learning and in web-based environments (Samoila et al. 2014; Syed Mustapha et al. 2017).

Organisational Application of the SECI Model at a German Airport

Contextual Background of the Airport Industry

The airport industry is strongly linked to three groups of stakeholders: first, the airlines and their alliances and, second, the general public such as governments, authorities and the community. The third group is represented by the passengers as customers of the airlines and airports, and especially their perceptions and expectations as to how the services at airports are delivered based

on technical features (e.g., wireless accessibility and network opportunities of the internet). Additionally, there is a strong shift observable regarding customers' expectations due to the emergence of low-cost carriers. These low-cost players have modified customer behaviour permanently by getting people to accept fewer benefits and levels of service at lower prices. This explains the cross-sectoral impact on airport groups from the private, public and economic sectors. From a business perspective, the market challenges and the strategic focus in the airport industry can be clustered into four main areas:

- structural changes such as privatisation and airport alliances and mergers;
- the rise of low cost carriers;
- development of airport cities and construction themes; and
- the digitalisation of airport services.

In the years from 2000 to the 2010, the economic deregulation of airlines has produced important challenges for the air transport industry. With increasing competition, air fares have dropped and demand has increased considerably, putting significant pressure on existing airport infrastructure. The authorities in charge of the sector have considered not only regulatory reform of airports but also a change in ownership as possible solutions to the problem of airport congestion and expansion of airport capacity. Airport privatisation has become a worldwide phenomenon, while many emerging countries have entered into short- and long-term airport privatisation transactions (e.g., airports in India and China). Nowadays, airports are generally run as modern businesses, rather than public utilities. This trend in the global airport industry means that airports have to attract new services and maintain high service levels at low operating costs to enable them to face down competition, as well as to maximise the generation of non-aeronautical revenues from terminal retail services, increase accountability and transparency to investors and develop vertical relations with the increasing number of global airline alliances or consolidated airline groups.

The complex network of an airport requires new developments in technology which are driven by labour, capital and material for business and leisure passengers and the different air transport options. The contents of both—the regulatory regime and the technological and business requirements—are the main challenging factors and a continuous pressure for cost-effective structures in the airport industry.

Historically, the infrastructure of transport has had profound impacts on regional and business development. The development of airport cities in Europe (e.g., Amsterdam Schiphol, Frankfurt Airport, London Heathrow), in

Asia (e.g., Incheon International, Hong Kong International, Singapore Changi, Tokyo International) and, in particular, in the Middle East (Abu Dhabi, Dubai, Kuwait) shows the third driver for the change in airports' business environments. The concept of airport cities focuses on business development and special adventure experiences for passengers, rather than on the traditional functionality of terminals. This is caused by the current evolution of airports as tourism and business hubs, such as those in Dubai and Singapore. In addition, the focus on having unique retail features, and on being a dining and entertainment destination combined with having green areas should differentiate airports from competitors. Airports try to increase their business mainly from two sides. The typical improvement options for airports consist first of the non-aeronautical revenue (such as retail in airport cities) followed by the regulatory management (improved operations on land and airside pricing).

Knowledge Vision and Objectives

The top manager in our case emerged from the financial department of a German airport. Most of the departments under his responsibility could be characterised by complex administrative processes with a high degree of connectivity to the operational handling of airport services. In all processes, mass data management was required to fulfil regulatory requirements and customer expectations. Besides these business needs, the main challenges originated from the organisational structures within the financial departments:

- an ageing workforce presents a risk of knowledge loss when experienced employees retire;
- process-specific knowledge existed as tacit knowledge and was locked in the minds of the long-term employed experts;
- new team members represented the new generation of employees and required sufficient training-on-the-job;
- explicit knowledge in terms of documentation, manuals and guidelines was outdated.

The threat of knowledge loss in this case determined the knowledge vision and the objective to preserve existing and create new tacit and explicit knowledge for the organisation by applying a structured process. The short-term target of the application of the SECI model was to convert the tacit knowledge of senior employees about the handling of administrative processes into

explicit knowledge documented in a process inventory. The long-term goal was to implement a continuous process of knowledge creation (and improvement) within the financial department to ensure that the new generation of employees was motivated to evolve the administrative processes in their departments.

Implementation of the SECI Model: Processes of Knowledge Conversion

To accomplish the different short- and long-term goals for the inter-organisational process of knowledge creation, the SECI model was implemented. A process inventory was developed during the various stages of the SECI model and in different administrative departments of the airport. The structure and frequency of the modes of conversion of the SECI model are shown in the Table 3.5.

Meetings concerning the process definitions for several financial departments were conducted in parallel. The meeting enrolment for the roughly 60 meetings showed a spread over the conversion modes of socialisation (20%), externalisation (15%), combination (40%) and internalisation (20%), which was determined by the specific types of administrative processes. In contrast, in the innovation processes of research and development of products or production design, the most important parts of the SECI model might be socialisation and externalisation.

The inter-organisational roleplay was categorised as follows:

- Financial experts (process knowledge owner)
  - responsible for specific process content
  - responsible for knowledge input
  - process approval in detail
- Process supervisors
  - responsible for structuring and moderating the process meetings
  - responsible for knowledge dissemination across the meetings
  - process approval on main process level
- Middle managers (superior role)
  - responsible for business process
  - approval on department level

Table 3.5 Knowledge conversion

Modes of knowledge conversion	Characteristics	Underlying behaviour patterns	Measures	Meeting enrolment of c. 60 meetings	People involvement
Socialisation	Sharing and creating tacit to tacit	Engage day-to-day social interactions Observations, intuition and direct experience	Kick-off meeting Establish a series of process meetings	25%	People with different organisational key roles
Externalisation	Articulating tacit to explicit	Convert abstract ideas into concrete forms of information through text, symbols or metaphors Demonstration, comparison and experimentation	Collecting data Information based on Input-Output forms	15%	
Combination	Systemising explicit to explicit	Exchange ideas and thoughts with co-workers Accumulation, reorganisation and evaluation	Reviewing forms in process meetings	40%	
Internalisation	Acquiring explicit to tacit	Receive and digest others' ideas for one's own use Embodiment, reflection in action	Codification of process forms Approval forms Transfer in routines	20%	

The relevant documents for the meetings were prepared by supporting staff. The SECI model, with the final output of the process inventory, was conducted multiple times: The initial implementation lasted over a period of 7–9 months; and, afterwards, the repetition cycles have been implemented on a yearly basis. The experience of the application of the SECI model in the financial department of an airport was summarised as follows:

- a focus on socialisation and externalisation emphasised tacit to tacit and tacit to explicit in the kick-off meeting for the department as a whole and in subsequent meetings concerning the different departments;
- the kick-off meeting and the subsequent department meetings created an appropriate and business process-oriented individual and group space (Ba);
- the focus on combination and internalisation connected explicit to explicit and explicit to tacit in the review of codification and approved the process documentation forms and the process inventory as a whole;
- the process inventory demonstrated the externalised results of the group content.

Nevertheless, the application of the SECI model created more complexity due to the integration of the conversion modes in practice. The practical application of the SECI model in specific business settings could be facilitated by simplification of these conversion modes. The challenge was to handle and control the dynamic of the processes and the created knowledge. This would be the prerequisite for testing the different specific extensions between the steps (Wu et al. 2010). The iteration in the exchange among the team members in the process meetings was, to some extent, time consuming but necessary to achieve quality approval.

Emphasising Ba for Organisational Implementation

The purpose of the organisational implementation of Ba was to create an efficient space and environment within which to share and exchange different opinions and knowledge about the specific administrative processes at an airport. Therefore, the structure of the SECI model and the definition of common practices for the self-organising teams supported the creation of the Ba, which was simplified as the place where knowledge is shared in context and where new knowledge is created. It supported, in the inter-organisational environment, a structure to follow and to achieve the different stages of process knowledge. The application of the SECI model in the organisational

setting at an airport revealed that this place, room, space or Ba was necessary to facilitate the exchange, sharing and therefore transfer of the specific knowledge. The Ba could be built intentionally. Furthermore, the repetition of the meetings in accordance with the SECI model was a core element of knowledge dissemination. The building of the Ba by the right mix of people with different organisational key roles and their interaction in self-organised meetings enabled knowledge conversion among individuals and groups. This will be explained in more detail in the next chapter.

General Impact of the Knowledge Creation Meetings

All participants were interviewed after the initial implementation of the knowledge creation process and they had to evaluate the outcomes of the process meetings that had been conducted. A general interview question included predetermined responses concerning the extent of knowledge increase and improvements (Fig. 3.4):

- the 'come-together' during the process meetings supported a new shared experience among the participants;
- the process meetings covered the relevant processes sufficiently and in a participatory manner;
- the formalisation of processes and steps into process descriptions was done in an effective way;
- the exchange during the process meetings created a broader and deeper understanding of the administrative processes among participants.

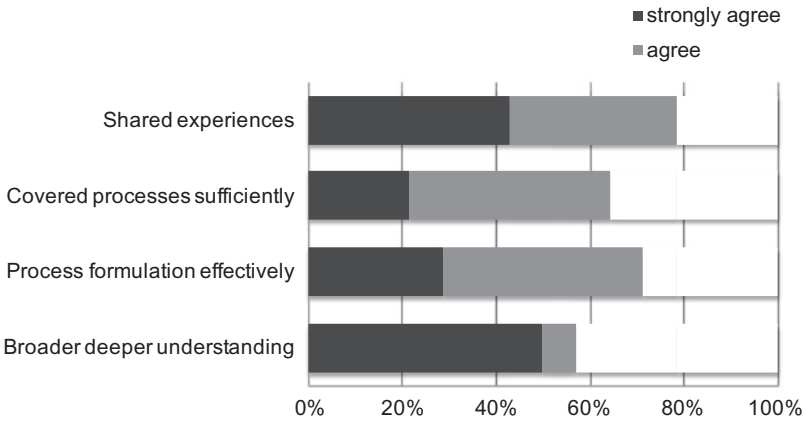

Fig. 3.4 Knowledge improvement by process meetings

An overall agreement from all participants was visible. While knowledge improvements could be achieved by sharing experiences (agreement about 80 %), the team members evaluated the process formulation in the meetings as effective (agreement about 70 %). Strong agreement was seen regarding the knowledge improvement of broader and deeper understanding of the administrative processes. Although there was a common view of all participants, the agreements have been analysed by the response groups' organisational key roles. Figure 3.5 illustrates the differences in responses regarding the three organisational key roles.

All key roles considered the broadening and deepening of understanding as the greatest possible impact of the process meetings. Shared experiences and effective process formulation were evaluated as high impact by the process supervisors and the management, but the process-owners' evaluations were likely to remain below.

Open questions in the interviews tended to uncover experiences and perceptions in regard to the process meetings. Besides the different perceptions of the participants depending on the key roles, a joint result of the process meetings was that the personal relationships between the participants changed. This can be interpreted as creation of Ba and especially as the mental space to enable knowledge creation. Therefore, some of the responses of participating groups should be explained (please refer to the direct quotations). The financial experts were focused on their desire to explain their experiences and perceptions:

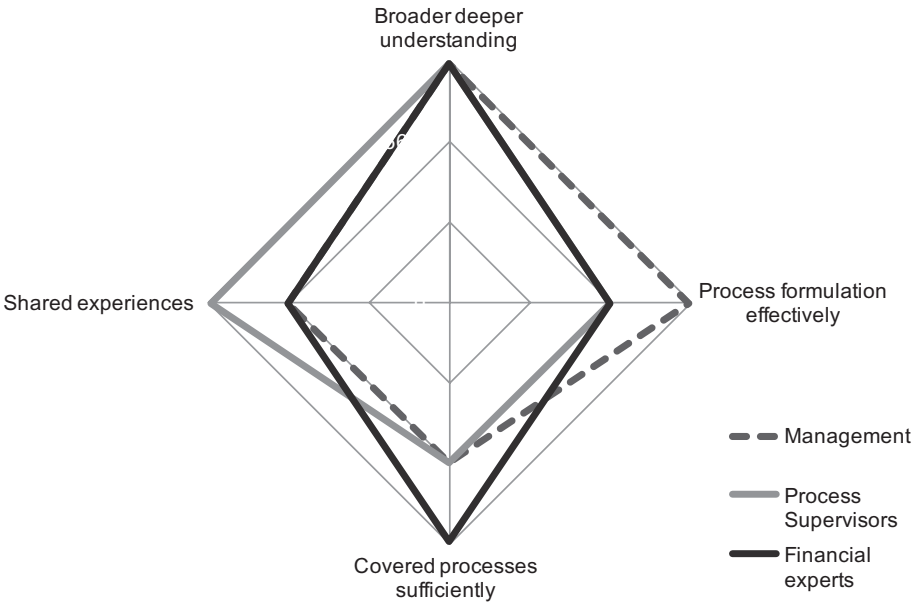

Fig. 3.5 Agreement related to organisational key roles

In general, it was a new experience, we haven't done this before in our department […]. *Generally, it was pretty complicated sometimes due to different use of wording* […] *to get the correct information for the person who was doing the interview for the process description*.

This quote reveals novelty of the experience and the complexity of the process itself. This was evident in the explanation of different understandings. The way that the interviewee explained the challenges refers to different individual and cultural behaviours, which were identified as one of the challenges for the globalisation of knowledge management practices. In addition, this was interpreted as one of the recurrent challenges to adoption of the SECI model, when different cultures and understandings exist within one organisation. Due to the existing cultural differences between Japan and Germany, a full and comprehensive application in the archetype mode was limited. Despite these differences, the meetings were seen in predominately positive terms:

My experience from these meetings was that they helped a lot, because you do not work alone, you do it with other people. You have three other 'heads', which are thinking […] *and perhaps you find a better way in some process steps*.

Within this statement, the importance of the improvement in processes is clear. In general, from the financial experts' view the process meetings were useful as a core element of the SECI model. From a perspective in practice, this demonstrated the importance of the relationships between different kinds of process knowledge. The major outcome was that a space or tool or meeting room created discussion and therefore knowledge. The statements that emerged show that the expected space, in terms of a Ba, was created and successfully used within the work environment.

The process supervisors were focused on the process descriptions. This showed their interest in explaining their experience and perception across the process and the business:

In general I could observe that the content was really person-related. Also it depends on the preparation. Some people have been prepared quite well, others were not good [sic] *prepared. It was important to clarify the goals of the meetings in advance to ensure that the meetings will be conducted efficiently and target-oriented.*

The team role process supervisor was characterised as having an observer view. Their task in the process meetings was to observe adherence to the

process description and the other participants. This revealed the focus on the process meeting and on 'how to manage' the meeting in efficient ways. Second, it illustrated the hurdles and challenges from this view, which comprised individual preparation and the effects on process management. Third, it referred to the discussion and difficulties of the managerial aspect of knowledge management as a process of organisational learning, where outcomes were managed. The fact that this observing role existed demonstrated the positive effects of the meetings, where the process supervisors took over responsibility, and the shift in awareness of their own roles. The focus on the process was a challenge to manage and was expressed by the following words from a process supervisor:

> *A summary: the processes are not complex at the surface but they are very complex at the bottom underneath the surface. I had also the impression, that many people don't realise how much knowledge they have. They know it to some extent, but they do not realise what they have in their heads and how important their knowledge is to the process.*

Results from Practice: Process Inventory

Besides the definition and documentation of the administrative processes, the structure of the process inventory was inter-organisationally implemented and the tasks were transferred into job descriptions. Some examples of typical financial processes are illustrated in Table 3.6.

The SECI model and the modes of knowledge conversion had different impacts on the process inventory. First, the quantity of the meetings within the financial departments was influenced by the length of service of the employees and the structure of the existing business processes (the meeting

Table 3.6 Examples of process content

Main process	Content
Master data	Includes the activities of master data maintenance, such as aircraft specific master data, data from the airline fleets directory
Billing	Incorporates the core elements of the process: adjoining and data check, the billing implementation, the data transfer and the billing order within the system
Customer complaints	Includes the processing of customer complaints, identified regarding the subprocesses, CIT systems, passenger-related data sheets and ground handling-related data of an airport
Billing cancellation	Includes the cancellation, credit voucher and/or additional charges referring to the different subprocesses and CIT systems

quantity of one unit was nearly doubled compared to other units). This revealed the influence of process quantity. Considering the number of subprocesses in all financial departments, a total of 110 processes were established, collected, reviewed and approved during 25 process meetings. The main challenge for the SECI model adoption and the participating employees in different key roles was: on average, 4.4 processes had to be analysed and documented in one meeting. Second, the different structures of the various financial departments created different outcomes regarding the degree of their complexity in automation and standardisation. A diverse and complex process structure had been developed (in particular in Communication-Information-Technology systems (CIT systems)-dominant processes and steps). In contrast, some departments revealed a heterogeneous process inventory and the processes were influenced by process-specific conditions:

- departments with connectivity to the customer base focused on descriptions of CIT systems, such as 'control of completeness supported by check screens', which led to knowledge about facts and figures in CIT systems;
- departments with a heterogeneous mix of services described better how to act, when and why, which led to greater knowledge about regulations and other people/departments.

These two examples illustrate the highly diverse structure of different knowledge elements. First, the process flows developed within the process meetings were important for the ranking of a process and the knowledge overview in general. Second, the process description was very important because of its extended map with reference to tacit knowledge codification. Third, the two parts of the codified explicit knowledge from the tacit (as an outcome from the process meetings) differed across the departments. This showed the ambiguous character of process descriptions: On the one hand, it was an excellent entry to know what the process purpose and process content was; on the other, limitation and risk of incompleteness existed if a process description was not detailed enough to explain how to do it.

Critical Evaluation and Conclusion

The SECI model is a popular and well-known model for researchers and practitioners in various disciplines, mainly for those looking to implement knowledge creation processes in their organisations. From the 1990s to the 2010s, research reveals that the SECI model can be applied in several fields of management and

various industries such as manufacturing, education and service businesses. Nowadays, researchers consider it as an innovation tool in learning environments as well. Besides the cultural aspects, adaptions of the traditional model include mainly the consideration of technological changes regarding communication and interaction (digitalisation and web networking). These adaptions underline that the SECI model is still current and valid, although it has now been in existence for a long time. In particular, the importance of the Ba as the enabling surroundings of the knowledge creation process needs further amendment in light of emerging technological change such as:

- automation and artificial intelligence in business processes;
- self-learning programming and software development;
- digitalisation of communication and interaction;
- big data management.

The development of the SECI model can be summarised in three stages: invention, current applications and future requirements (Fig. 3.6).

Taking into account that actual challenges such as the increase in complexity and innovation speed require an adaption of the SECI model, the following aspects have to be considered in future applications:

- it is not just individuals, groups and organisations that are involved in knowledge creation. Artificial intelligence as hard knowledge assets will be

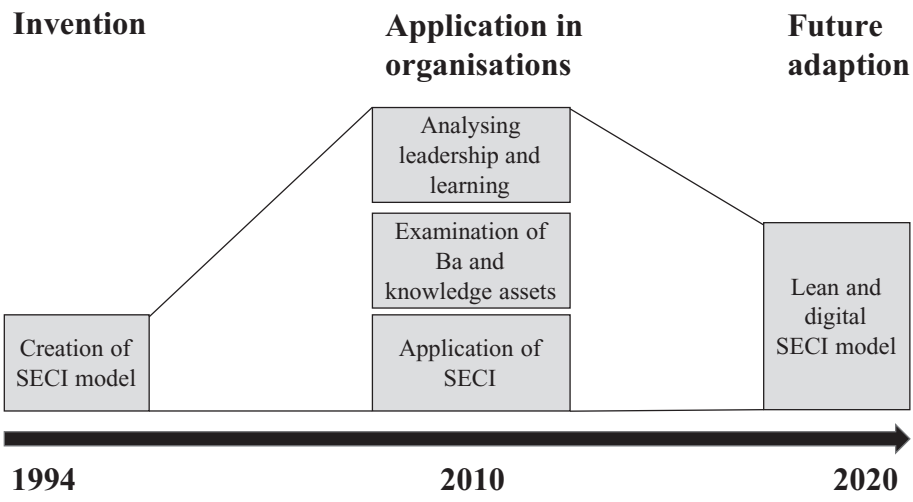

Fig. 3.6 Stages of the application of the SECI model

those that influence the modes of knowledge conversion from explicit to explicit;
- interaction among individuals, groups and organisations has to be extended through interaction among individuals and self-learning programming (knowledge assets as outputs);
- digitalisation and big data management lead to new communication styles, devices and applications;
- innovation and process development speed accelerate the spiral of the knowledge creation process.

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4

Organisational Learning and Knowledge Management: A Prospective Analysis Based on the Levels of Consciousness

Ricardo Chiva, Rafael Lapiedra, Joaquín Alegre, and Sandra Miralles

Introduction

In 2005 we published in the journal *Management Learning* a paper on the relationships between organizational learning and organizational knowledge (Chiva and Alegre 2005). In the paper, we stated that these ontologies were strongly related where we proposed an integrative approach. In fact, in some ways we considered that the conceptions of organizational learning and knowledge management were strongly connected and in some approaches and applications almost synonymous. Twelve years have since passed and we wonder about the future of these concepts, how they might evolve, where they overlap, how they can be applied in real-world settings and how they might address future challenges

In order to address some of these challenges, this chapter proposes to take into account the levels of consciousness (Beck and Cowan 1996; Gebser 1949; Graves 1970; Wilber 2000) that describe the different stages of human or social evolution. According to these authors and their approach, human beings and their social systems, like organizations, advance in stages, evolving by sudden transformations, in the way that a caterpillar becomes a butterfly (Laloux 2014). Every stage represents a particular stadium with an increased maturity, complexity and consciousness level. A level of consciousness repre-

R. Chiva (✉) • R. Lapiedra • S. Miralles
Universitat Jaume I, Castellón de la Plana, Spain

J. Alegre (✉)
Universitat de València, Valencia, Spain

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sents a stadium in human and social evolution and implies a framework through which we interpret the world (Chiva 2017).

In the last few years, some works have related each level of consciousness or stage of human evolution and social systems with a particular type of organization (e.g., Cacioppe and Edwards 2005; Cowan and Todorovic 2000; Laloux 2014) or even with a particular human resource management system (Chiva 2014). Specifically, Chiva (2017) claims that the learning organization will be linked to the highest level of consciousness.

The literature has identified seven stages of human evolution and social systems or levels of consciousness (Beck and Cowan 1996; Laloux 2014; Wilber 2000), namely:

1. Reactive, survival, foraging, instinctive, ego not fully formed, small bands of family kinships, no chiefs.
2. Magic (not aware of cause and effect), search for security, tribes, no death consciousness. Elderly people are the authority.
3. Power, domination, impulsiveness; the world is a tough place where only the powerful, or those that the latter protect, satisfy their needs. The boss (or alpha male) has to provoke fear.
4. Order, rules, conformism, morality, bureaucracy, effectiveness. Do the right thing and you will be rewarded.
5. Achievement, autonomy, competency, empirical and scientific research. Effectiveness substitutes morality and efficiency. Attain one's goals.
6. Cooperation, tolerance, pluralism, solidarity, social responsibility, culture, values, teamwork, empowerment.
7. Evolutionary, common welfare, compassion, harmony, holism, systemic thinking, self-management, wholeness.

However, only the latter five levels are related to types of organizations, or, in other words, only those last five levels allow the existence of organizations (Laloux 2014). Chiva (2017) analyses and relates those levels of consciousness to a certain organizational climate, structure or configuration (Mintzberg 1989) and to a specific level of organizational learning (Argyris and Schön 1974, 1978, 1996; Bateson 1972; Swieringa and Wierdsma 1992; Tosey et al. 2012; Visser 2007). Table 4.1 summarizes the ideas behind each of these levels of consciousness.

Based on this typology, we understand that the last level, common welfare and holism, represents the apex of organizational and human evolution. Although Chiva (2017) proposes triple-loop learning as the suitable level of

Table 4.1 Organizations, levels of consciousness, organizational learning levels and organizational structure (Based on Chiva (2017))

Organization	Level of consciousness	Level of organizational learning
The control-autocratic organization	Power and domination	Zero learning
The control-bureaucratic organization	Order and rules	Single-loop learning
The control-meritocratic organization	Achievement and autonomy	Double-loop learning
The commitment organization	Cooperation and tolerance	Deutero-learning or meta-learning
The learning organization	Common welfare and holism	Triple-loop learning

learning for this level of consciousness, we wonder about the implications of this type of learning and how it connects with knowledge management.

So, in the following paragraphs we analyse organizational learning and knowledge management as concepts related to every consciousness level within the organization. First, we link the two perspectives presented by Chiva and Alegre (2005) to the four first levels of Table 4.1: that is, we link the individual learning-knowledge possession to the control organizations, and the social learning-knowledge process to the commitment organization. Second, we connect the last level of consciousness or learning organization, as defined by Chiva (2017), with a new view of learning and knowledge (Table 4.2).

Organizational Learning and Knowledge Management: Traditional Approaches

Organizational learning and knowledge literature (Chiva and Alegre 2005) have traditionally considered two approaches: the individual learning-cognitive possession knowledge and the social learning-social process knowledge.

The cognitive perspective of organizational learning connects with the ideas of organizational knowledge as individual knowledge shared among all the members of the organization (Grant 1996), as knowledge embedded in rules and routines (Nelson and Winter 1982), and as individual knowledge brought into a social context (Nonaka 1994). All of them take an idea of knowledge as perceptive and as a commodity. Based on this view, organizational learning is the efficient procedure for the processing, interpretation and improvement of representations of reality, which is knowledge. This process takes place through

Table 4.2 Organizations, levels of consciousness, organizational learning levels, perspectives and knowledge management perspectives (Based on Chiva (2017) and Chiva and Alegre (2005))

Organization	Level of consciousness	Level of organizational learning	Organizational learning perspective	Knowledge (management) perspective
The control-autocratic organization	Power and domination	Zero learning	Individual learning	Cognitive possession
The control-bureaucratic organization	Order and rules	Single-loop learning		
The control-meritocratic organization	Achievement and autonomy	Double-loop learning		
The commitment organization	Cooperation and tolerance	Deutero-learning or meta-learning	Social learning	Social process
The learning organization	Common welfare and holism	Triple-loop learning	'Mindful learning'	Cognitive and social hindrance

the members of the organization, or by supposing that the organization has the same cognitive processes as its members. Knowledge is codified, stored and easily transmitted. When this transmission of knowledge occurs, it is embedded in rules or routines, or brought into a social context; then organizational knowledge is created. Therefore, learning and knowledge are separate, which allows them to be dealt with independently.

Individualism is essential in the first three organizations shown in Table 4.1, the three control organizations. Individuals, mainly top managers, are the ones who decide what to change, make all decisions or learn. When they learn, they spread their knowledge with the rest of the members of the organization.

The control-autocratic organization stresses the importance of the continuous exercise of power in interpersonal relationships (Cacioppe and Edwards 2005; Cowan and Todorovic 2000; Laloux 2014). The chief has to demonstrate power and to bend others to his will to stay in position: fear is the glue of the organization. Thus, predatory and autocratic leaders manage these organizations. There is normally not much evidence of hierarchy or job titles but there is a certain division of labour among the members of the organization. Direct supervision is the main coordinating mechanism, and the strategic apex is the most important part of the organization. So, it might be related to Mintzberg's simple configuration (1989).

These organizations tend to perceive their environments as hostile and chaotic, reacting to the various stimuli they face. Therefore, these highly reactive and impulsive organizations might be associated with Bateson's (1972) zero learning. Zero learning entails responding to stimuli but making no changes based on experience or information. This happens because of habituation, completed learning or a genetically fixed response (Visser 2003). Zero learning simply involves the receipt of a signal, not subject to correction by trial and error (Bateson 1972).

The control-bureaucratic organization is based on a static worldview of simple morals: There is only one right way of doing things. Its aim is efficiency or a better use of resources (less cost, more production), thereby reaching higher levels of productivity (Cacioppe and Edwards 2005; Cowan and Todorovic 2000; Laloux 2014).

According to Laloux (2014), these organizations brought about two main breakthroughs: Such organizations can plan for the medium and long term and they can create organizational structures that are stable. Therefore, formal hierarchies and job titles now become essential. Moreover, planning (thinking) and execution (doing) are separated within the organization.

These organizations are very stable and, in them, changes are viewed with suspicion. Only improvements are largely accepted. Everything seems to be predictable, safe and relatively static. Leaders are paternalistic and aim to control everything, as employees are perceived as lazy and dishonest. In such a scenario, if one does the right thing, one is rewarded.

There is a high degree of standardization or process here: norms and rules determine everything one should do in the control-bureaucratic organizations. Processes are very important in order to replicate what has worked. This is why they live in the past—seen thus, the future is repetition of the past. With it, critical knowledge does not depend upon one person. Minzberg's machine configurations (1989) are strongly related to this approach.

In terms of learning, due to the importance it places on efficiency or aiming to do things right, and to avoid questioning the rules, single-loop learning might be the most important organizational learning type (Argyris and Schön 1974, 1978, 1996). In single-loop learning, people, organizations or groups modify their actions according to the difference between expected and reached outcomes. This occurs when errors are detected and corrected without modifying a firm's existing policies, goals or assumptions. In other words, such learning tries to improve any rule, process or action, when errors occur or mistakes happen, without questioning its underlying assumptions.

Laloux (2014) considers that in the control-meritocratic organization, or achievement and autonomy level of consciousness, there is no absolute right

and wrong—though, plainly, there are some things that work better than others. Authority does not always have the right answer, so there is an increasing dose of scepticism. On the other hand, it is not only about if one is doing things right but also if one is doing the right things. Here, effectiveness replaces efficiency. Therefore, achieving the right goals becomes an key aim (Cacioppe and Edwards 2005; Cowan and Todorovic 2000).

Consequently, double-loop learning (Argyris and Schön 1974, 1978, 1996) becomes essential in control-meritocratic organizations. In double-loop learning, individuals, groups or organizations also correct or change the underlying causes behind any procedure or task. So, norms, policies, ways of working, rules and assumptions are questioned. It is about changing the rules. Double-loop learning forces us to think on our goals, policies or operating assumptions. It arises when errors are detected and corrected such that existing policies, goals and assumptions are called into question and challenged.

Control-meritocratic organizations focus on the future, on the things that they want or need to do. So, achievement is an important concept here. Change and innovation present opportunities, and are also seen as vital.

Standardization of outputs (Mintzberg 1989), which achieves coordination by specifying the results of different work, would be the most important coordinating mechanism, which relates this sort of organization to Minztberg's diversified configuration. Management by objectives or by results (Drucker 1954), or the process of defining specific objectives within an organization that management can convey to organization members, is spread over these organizations. So, indicators, goals, strategies and strategic planning are crucial.

Power is vested in individuals that achieve certain goals or have particular merits. Meritocracy and incentive systems turn out to be essential. Thus, more is always better according to this level of consciousness, which brings about overconsumption, corporate greed and materialism. On the other hand, management must solve only tangible problems, putting tasks before relationships. It is represented by transactional leaders that value dispassionate rationality and are wary of emotions.

In sum, in the control organizations knowledge is something that individuals and organizations possess and that should be controlled or managed. Learning happens mainly individually in such organizations.

However, in the commitment organization, social aspects become central. The social perspective of organizational learning is linked to the ideas of knowledge as a basis for a dynamic theory in the company (Spender 1996). According to the ideas put forward by Spender (1996) or Blackler (1995), organizational knowledge is socially constructed, and thus particular empha-

sis is placed on the process, moving closer to the concept of organizational learning. The social-process perspective is based on social activity and discursive behaviour, both of which give rise to social constructions: reality is socially constructed (Berger and Luckmann 1966). According to Laloux (2014), Southwest Airlines and Ben & Jerry's are conspicuous examples of these sorts of organizations.

From the social-process perspective, organizational learning and organizational knowledge were considered as quite similar (given that the latter is a process, and not a resource), and signify the social construction of beliefs and shared meanings, where social context, cultural artefacts, collective group actions and participation play a vital role. Learning is not understood as a way of knowing the world but as a way of being in the world (Gherardi 1999). This unified social-process perspective of organizational learning and organizational knowledge has similar sources and, consequently, languages, which seems to improve the chances of integration of both literatures.

We relate this perception of learning and knowledge to a cooperation and tolerance level of consciousness, which considers that there is more to life than success or failure, taking into account the dark side of the previous level: materialistic obsession, social inequality and the loss of community (Cacioppe and Edwards 2005; Cowan and Todorovic 2000; Laloux 2014). The pluralistic level of consciousness is highly sensitive to people's feelings, fairness, equality, cooperation, learning and consensus. According to Laloux (2014), one of the main characteristics of such as organization is the concept of belonging. Charismatic or transformational leaders play a major role.

Furthermore, the commitment organization stresses the importance of bottom-up processes, gathering input from all and trying to bring opposing points of view to eventual consensus. Empowerment and decentralization are spread over the organization. The commitment organization aims at getting more from workers by giving more to them (Baron and Kreps 1999: 189).

Rules in this sort of organization tend to be social, based on the social control or culture. Culture is paramount here, where values, and cultural aspects are taken into account. Consequently, standardization of skills and (cultural) norms are the most important coordinating mechanism, which might imply that this is related to Mintzberg's (1989) professional and missionary configuration.

Therefore, the aim of this organization is to develop a context and a culture where cooperation, equality, consensus or learning takes place. This is why deutero-learning (Argyris and Schön 1974, 1978, 1996) or meta-learning (Visser 2007), in terms of carrying out single- and double-loop learning,

becomes important. Learning to learn, to cooperate, to empower, or to act with fairness might be some of the examples of such an approach.

Deutero-learning (Argyris and Schön 1974, 1978, 1996) or meta-learning (Visser 2007) invokes a need to reflect on and inquire into the process in which single- and double-loop learning are taking place. Reflecting on the process of single-loop learning implies thinking about ways to improve error detection and correction, and thus to improve the effectiveness of action strategies (Visser 2007). Reflecting on the process of double-loop learning involves thinking about ways to improve discussion about norms and values underlying action strategies (Visser 2007).

Organizational Learning and Knowledge Management: Towards the Last Stage

In our 2005 paper, we state that two main explanations seem to be put forward for how organizations learn (Chiva 2004; Chiva and Alegre 2005; Cook and Yanow 1996; Easterby-Smith et al. 1998): the individual view and the social view. The individual view considers learning as an individual phenomenon and consequently understands that organizations learn through individuals (e.g., Huber 1991). The social view considers learning as a social phenomenon and consequently understands that organizations learnt through communities and groups (e.g., Brown and Duguid 1991). In the previous section, we connected the first view to the control organizations and the second view to the commitment organizations. Nowadays researchers consider there to be a third approach or perspective that attempts to encompass the two (e.g., Clegg et al. 2005; Elkjaer 2004; Örtenblad 2002). So, organizational learning happens through individuals and through groups.

However, in order to go more deeply into the third view, we consider that the question is one of when a certain type or level of learning happens: single-, double-, triple-loop or deutero-learning. In our opinion, and based on the concept of consciousness level already mentioned, the essence of organizational learning is the consciousness level of those individuals and groups of individuals. So, depending on the level of consciousness, a certain type of learning might happen, as is revealed in Tables 4.1 and 4.2.

Consciousness can be defined as the degree of awareness of one's inner and outer worlds, being mentally perceptive and feeling the undivided wholeness of existence (Wilber 2000). There are several levels and states of consciousness. They entail movement towards more complexity, greater awareness and

less egocentrism (Boucouvalas 1993). So, consciousness levels imply certain states of consciousness. A consciousness state might be defined by the degree of attention and awareness of the present moment and by the use of our mind/thinking (judging, evaluating, interpreting, comparing etc.) (Glomb et al. 2011). We consider three states of consciousness: mindlessness, flow and mindfulness (Dane 2011). Mindfulness could be related to the top level of consciousness (evolutionary, common welfare).

Mindfulness is an ancient concept, although has recently entered the scientific arena as a construct of significant interest. Mindfulness has been analysed and developed by several scientific disciplines, such as philosophy, medicine, medical psychology and social psychology (Gärtner 2011). Nevertheless, for centuries, thinkers from a number of societies, mainly from eastern tradition, have argued its importance (Dane 2011; Hanh 1976). Most of the literature understands that there are two main approaches to the concept: eastern and western (Weick and Putnam 2006; Weick and Sutcliffe 2006).

The eastern approach of mindfulness focuses on internal processes of attention (Weick and Sutcliffe 2006), describing mindfulness as nonsuperficial and nonjudgemental awareness, trying to see things deeply, beyond the level of concepts and opinions. Similarly, Weick and Putnam (2006) consider that eastern thought pays more attention to internal processes of mind rather than to the contents of mind. It means to hang on to current objects, to remember them, and not lose sight of them through distraction, wandering attention, associative thinking, explaining away or rejection. Mindfulness works directly on attentional processes, such as a focus on the present and the letting go of concepts.

According to some literature (Brown and Ryan 2003; Dane 2011; Weick and Putnam 2006), these ideas are grounded in Buddhism and the practice of meditation, or in other contemplative traditions where conscious attention and awareness are actively cultivated. Eastern versions of mindfulness equate it with nonjudgemental observation, impartial watchfulness, nonconceptual awareness, present-time awareness, nonegoistic alertness, goalless awareness and awareness of change (Gunaratana 2002; Weick and Sutcliffe 2006). So, Weick and Sutcliffe (2006) consider that the eastern approach emphasizes nonconceptual awareness and reduced distraction. In similar terms, Baer et al. (2006) consider mindfulness to include bringing one's complete attention to the experiences occurring in the present moment, in a nonjudgmental or accepting way (Brown and Ryan 2003; Marlatt and Kristeller 1999).

Although in the eastern approach of mindfulness is cultivated through meditative practice, according to Brown and Ryan (2003), mindfulness does not always require meditation. Indeed, mindfulness is within reach of many

individuals, either by meditating (Giluk 2009; Weick and Sutcliffe 2006), or by reconceptualizing the elements within their environment in a novel, generative way (Langer 1989a, b; Langer and Piper 1987). This is the western approach. Dane (2011) considers that eastern and western approaches both involve directing attention to present-moment phenomena and maintaining a wide attentional breadth. However, the western approach of mindfulness involves cognitive differentiation—the process of drawing novel distinctions, reconceptualizing elements within the environment in a new way (Langer 2009; Langer and Moldoveanu 2000), whereas the eastern approach requires the practice of meditation (Brown and Ryan 2003; Dane 2011; Weick and Putnam 2006).

Brown and Ryan (2003) affirm that the western approach (Langer 2005) emphasizes active cognitive operations on perceptual inputs from the external environment, such as the creation of new categories and the seeking of multiple perspectives. Weick and Sutcliffe (2006) suggest that western approaches to mindfulness concentrate on concepts and making distinctions, and focus on learning to switch modes of thinking. Fiol and O'Connor (2003) consider that Langer (1989a, b) introduced the concept of mindfulness in the western world, and define it as a state of alertness and lively awareness that is manifested in active information processing, characterized by the creation and refinement of categories and distinctions and the awareness of multiple perspectives. Langer (1989a) specifies the concept of mindfulness as a state of active awareness characterized by the continual creation and refinement of categories, an openness to new information, and a willingness to view contexts from multiple perspectives (Levinthal and Rerup 2006).

Fiol and O'Connor (2003) affirm that those who manifest mindfulness engage in thought patterns that allow them to make a larger number of relevant and more precise distinctions. Mindful scanning entails an expanded data search that extends beyond data relevant to past events and past behaviours, or what others are doing, and that leads to new, pertinent distinctions and categories. Mindful, self-questioning interpretations lead to regular efforts to update and expand awareness of multiple perspectives most relevant to the organization. The western approach connects mindfulness to the idea of triple-loop learning, and understands that by questioning and by being open to new information and new approaches we will become fully attentive and might also place any cognitive filters aside. Based on this belief, we consider the third approach as mindful learning, a learning process where mindfulness has a key role.

Glomb et al. (2011) define mindfulness as a state of consciousness characterized by receptive attention to and awareness of present events and experi-

ences, without evaluation, judgement and cognitive filters. So, attention is focused on present-moment phenomena occurring both externally and internally and maintaining a wide attentional breadth (Dane 2011) and there is no ego; so, our mind and thinking are put aside. Consequently, individuals feel the undivided wholeness of existence (Wilber 2000), by being fully conscious and being truly themselves. Mindfulness thus implies transcending the ego or the mind. According to Tolle (2005), the ego is the identification with our thinking and the emotions related to this. We identify ourselves with a group, an ideology, a culture, possessions, nationality, profession, with the past and so on. This then becomes our identity. Ego is related to separation and identification, so fear takes hold of us: Identification brings the fear of losing things. Tolle (2005) stresses that we are not the voice in our heads; we are not those thoughts.

The last level of consciousness happens when one learns to disidentify from one's own ego (Laloux 2014). By looking at it from a distance, one can see how its fears, ambitions and desires run one's life (Cacioppe and Edwards 2005; Cowan and Todorovic 2000; Laloux 2014). Laloux (2014) considers that when we are fused with our ego, we are driven to make decisions informed by external factors, such as goals, social norms, authority and so forth. In the highest level of consciousness, we shift from external to internal yardsticks in our decision-making. So, now we are concerned with inner rightness.

Laloux (2014) considers that on this level the ultimate goal in life is to become the truest expression of ourselves, to live in authentic selfhood. This can be strongly related to Senge's (1990) discipline of personal mastery, which is one of his requirements to create a learning organization.

Mutual adjustment, which achieves coordination by the simple process of informal communication, could be considered the most important coordinating mechanism of the learning organization. It could then be related to Mintzberg's (1989) adhocracy, which is a flexible, adaptable and informal style of organization that is defined by a lack of formal structure; or to Robertson's (2015) holacracy, which is a flat organization based on self-management teams. So, peer relationships are essential, beyond hierarchy or consensus. These organizations are characterized by the existence of no status symbols, which implies no bosses or subordinates. Everyone is simply a member of the organization. Due to trust in people, employees do not need to sign in or out. There are not any functional departments, especially for innovation and human resource management. All members assume those functions. There tend to be long-lasting relationships with customers and suppliers. People work on whatever they want and with whom they wish. They can experiment and try out new things easily, as they are not afraid of making

mistakes. Transparency is a must in such organizations; all information is available. People assume roles instead of jobs or job titles, and this fosters flexibility. Coordination and meetings happen when needs arise and coordination usually arises informally. But teams and teamwork are essential. In fact, these organizations tend to focus on team performance. Anyone can make decisions on any matter, but it is highly recommended to ask for advice.

There are usually rotation programmes to immerse new members in the organization. However, as conflicts do occur in these organizations, multistep conflict resolution procedures are often proposed. These organizations tend to be self-decorated, warm spaces, open to children and pets, and meditation and quiet spaces are found in most such learning organizations. Emotions become paramount in these organizations: Intuition—and not rationality—is king. Intuition honours the complex, ambiguous, paradoxical, nonlinear nature of reality: We unconsciously connect patterns in a way that our rational mind cannot. Thus, these organizations foster going beyond the 'professional' self by stressing the importance of emotions, personal life, spirituality, intuition, doubts and so on. Change is no longer a relevant topic, because learning organizations adapt and learn constantly. Members are invited to participate in inquiring about the organization's evolution, purpose, values and fundamental values, and approach that is strongly related to triple-loop learning (Swieringa and Wierdsma 1992; Tosey et al. 2012).

As Chiva (2017) proposes, the learning organization fosters triple-loop learning. Triple-loop learning (Nielsen 1993; Swieringa and Wierdsma 1992; Tosey et al. 2012) happens when the essential principles on which the organization is founded come under discussion, involving the development of new principles, with which the organization can proceed to a subsequent phase. This level of learning is considered superior to single- and double-loop learning, and implies questioning the underlying paradigms, purposes, essential principles, whatever governs those governing variables, and the role or the mission of the organization. Clear examples of such organizations are Valve, Semco or Morning Star.

In one of our previous works (Chiva et al. 2010), we claim that generative learning (a sort of triple-loop learning) involves avoiding previous knowledge. According to Bohm (1980) and Krishnamurti (1994), real learning ceases when there is just accumulation of knowledge; generative learning only occurs when there is no accumulation at all. We believe that this is an important statement that stresses the limited importance, and the implicit danger, of knowledge in facing generative or triple-loop learning and, hence, radical innovations. Most literature has theoretically and empirically underlined the importance of knowledge to develop innovations (e.g., Leonard-Barton 1992;

Nonaka and Takeuchi 1995). However, perhaps these innovations are fundamentally incremental. Based on our theoretical model, we propose that a focus on knowledge could represent an obstacle to increasing radical innovations. On the other hand, knowledge represents the ego, separation and identification.

Similarly, the limited importance of knowledge for generative or triple-loop learning might also imply that activities such as thinking or reasoning are not so essential for—and may even be a hindrance to—generative learning. Krishnamurti (1994) maintains that thinking is the reaction to what one knows: Knowledge reacts, and that is what we call thinking. However, generative learning underlines the importance of intuition, inquiry or attention, which relates to concepts such as creativity or imagination. Perhaps creativeness or intuition has always been essential for human beings, even more so than rationality and thinking. Therefore, mindfulness becomes a crucial issue for this type of learning. This is why we refer to this sort of learning as mindful learning (Table 4.2). Mindfulness is a state that fosters creativity and allows individuals to be fully present and attentive, without thinking. And this is the reason why mindfulness and learning, from this perspective, are strongly linked. If individuals are thinking and using knowledge when listening, observing or experimenting, they will always interpret or adapt anything in relation to their past views.

Conclusion

In this chapter, once the two known approaches to learning are analysed (individual and social learning), we propose a third approach: a mindful learning perspective, based on the highest level of consciousness and related to triple-loop learning and the learning organization. This approach to learning, strongly associated with mindfulness, considers knowledge as a hindrance to learning.

According to Krishnamurti (1994), knowledge is past. And accumulated knowledge tends to enslave you to accepted norms and ways of thinking. Learning is always in the future, it is a continually moving process, where the moment that you learn something it becomes knowledge. Further, knowledge, though necessary to live in this world, belongs to the past and is a burden. Learning is not listening with one's knowledge; real learning has to do with being fully conscious, mindful, humble (having no knowledge)—otherwise, we only increase our knowledge. To learn is not to collect knowledge. It is important to learn to observe without applying previous knowledge

(see Chap. 5, in this volume). If you listen or observe with knowledge, you are not listening or observing, but you are interpreting, judging, comparing, evaluating, so ego is present and at work. Therefore, from this perspective knowledge will be a hindrance to organizational learning. Although knowledge is very important, since it resides in systems, processes and policies, merely collecting knowledge that feeds back from the organization to new individuals as they join may not be enough to achieve generative or triple-loop learning. Stepping back from this, through learned mindfulness, will be needed to challenge the feed-forward and feedback process of organizational learning (Crossan et al. 1999; Murray and Donegan 2003). So, if knowledge is not the central element in the learning process, what role can knowledge management play in contemporary organizations?

Cohen and Levinthal (1990) state that knowledge is a central element in the learning process, which consists of the acquisition, integration and exploitation of knowledge. According to our approach, we not only question its importance but suggest that knowledge might be harmful. Girard and Girard (2015) define knowledge management as the process of creating, sharing, using and managing the knowledge and information of an organization. So, based on our view, knowledge should be managed to keep it aside or to question, which does not mean forgetting or discarding knowledge-unlearning (Tsang 1997) but not using it for learning.

We describe this type of learning as mindful learning because mindfulness plays a central role in it. Individuals should be mindful or fully attentive in order to avoid thinking or using their mind and knowledge. Mindfulness is considered as a state of high consciousness (Glomb et al. 2011). Attaining a mindful state is an inherent human capacity, an assertion implying that most people have been or at least can be mindful at one point or another. Nevertheless, research shows that, due to dispositional tendencies, some people may be in a mindful state of consciousness more often than others (Dane 2011). Hülsheger et al. (2013) consider mindfulness as an inherent human capacity that varies in strength, across both situations and persons.

The state of consciousness characterizing mindfulness is one in which attention focuses on the 'here and now', the present moment (Dane 2011; Weick and Putnam 2006), as opposed to preoccupation with thoughts about the past or the future (Brown and Ryan 2003). Mindfulness involves attending to external and internal phenomena, because they are both in the present moment (Brown and Ryan 2003). Therefore, the more conscious we are, the more connections we perceive around us, and the more connected we feel with everything and everyone. In this line, Brown et al. (2007) consider that the study of mindfulness presents challenges to popular western cultural atti-

tudes, and to some established paradigms that emphasize the primacy of the ego.

When individuals are or become more conscious, they are more aware of their internal and external worlds, which makes them less egocentric and more altruistic (Boucouvalas 1993; Wilber 2000). Boucouvalas (1993) considers that when conscious individuals perceive their commonality with all living creatures and thus protect the environment and the system, they are motivated from within, not just from a feeling of moral obligation emanating from externally given 'shoulds' and 'oughts'. In fact, she relates high consciousness to Bohm's (1980) implicate order of the universe, which is a world of interconnectedness, where new explicate orders arise and triple-loop learning is developed.

In sum, future research should empirically validate the relationships proposed in this chapter: mindfulness, triple-loop learning, the learning organization, the hindrance of knowledge, or the existence of characteristics within the organization such as common welfare, holism, compassion or altruism. We understand that all of them are connected and imply a new vision or paradigm for organizations that has important implications for individuals, who should aim to be mindful and to approach triple-loop learning, and for organizations that should create a context for learning where mindfulness, compassion, altruism and triple-loop learning are essential elements. Finally, there is also the recognition of a context where knowledge is important but might present a problem for real or mindful learning.

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5

Knowledge Management and Unlearning/ Forgetting

Karen L. Becker

Introduction and Outline

Knowledge management relies heavily on the acquisition and sharing of knowledge by both individuals and organisations, and learning is often considered to be a critical element in the effective development and management of knowledge. However, there has been less consideration given to the concept of unlearning and its implications for knowledge management. Unlearning first emerged in the organisational literature in the 1980s, and the chapter by Hedberg (1981) is generally acknowledged as one of the seminal works in this area. Since that time, individual and organisational unlearning has received significant attention; yet, certainly not as much as the related areas of individual and organisational learning.

When unlearning emerged in organisational literature, it was in response to the growing acknowledgement that individuals and organisations are not 'blank slates' and that the existence of prior knowledge may hinder future efforts to learn or acquire knowledge. The focus of this chapter is on unlearning and it argues that releasing prior knowledge, or at least acknowledging its presence and shortcomings, may hold the key to successful learning and knowledge management, both at the individual and collective levels.

The aims of this chapter are to:

K. L. Becker (✉)
Faculty of Arts, Business and Law, University of the Sunshine Coast, Sippy Downs, QLD, Australia

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- clarify and define the concept of unlearning and how it applies to individuals and organisations;
- detail the key theories and models that have been used to understand unlearning;
- analyse individual unlearning and collective unlearning and their implications for knowledge management;
- provide examples of unlearning in practice—both the challenges and successes;
- identify the implications of unlearning for knowledge management practice.

Unlearning: The Background to a Concept

Knowledge plays a critical role in all organisations and those taking a knowledge-based view of the firm (Grant 1996; Nickerson and Zenger 2004) argue that organisations can create competitive advantage from their knowledge assets. Such perspectives suggest that if organisations can effectively develop, acquire and share knowledge across the organisation, they will be able to compete in a rapidly changing environment. In a similar vein, those individuals who have deep knowledge and expertise, and can continue to enhance their expertise, are of great value to an organisation. Therefore, for both individuals and organisations, being able to continue to develop knowledge is a critical issue. However, when pre-existing knowledge threatens the ability to learn and embrace new knowledge or ways of thinking and behaving, the ability of individuals and organisations to respond to a changing environment may be threatened. It has been argued for some time that along with the need to facilitate learning, there is equally a need to focus on relinquishing pre-existing knowledge, both on a collective and individual level, referred to by many as unlearning (Akgun et al. 2007; Hedberg 1981; Lei et al. 1999; Newstrom 1983; Starbuck 1996; Tsang and Zahra 2008).

When unlearning was first discussed, the extent to which the organisational environment would change could not have been anticipated. For example, the increasing rate of advancements in technology means that new generations have access to far more data and information that can be transferred faster, presenting not only opportunities but also challenges for today's organisations. With this ever-growing rate of knowledge transfer, unlearning is, and will continue to be, a critical issue for organisations.

Defining Unlearning

Unlearning has been discussed in many disciplines including psychology, organisational studies, management and education. It has also been applied to many different situations. Like learning, unlearning has been discussed at both the individual and collective (team or organisational) levels. In some cases, unlearning refers to individuals letting go of past practice or knowledge and embracing new ways of behaving or utilising new knowledge (Baxter 2000; Bridges 1991; Duffy 2003). However, unlearning has also been discussed at the level of the organisation, suggesting that organisations, as entities in themselves, need to be prepared to relinquish previous processes, systems or ways of working in order to adapt to changing circumstances, requirements and expectations, both internal and external to the organisation (Hamel and Prahalad 1994; Harvey and Buckley 2002; Hedberg 1981). Table 5.1 provides a sample of unlearning definitions found in the literature,

Table 5.1 Definitions of unlearning

Author	Year	Definition
Hedberg	1981	'Knowledge grows, and simultaneously it becomes obsolete as reality changes. Understanding involves both learning new knowledge and discarding obsolete and misleading knowledge.' (Hedberg 1981: 3)
Newstrom	1983	'[T]he process of reducing or eliminating preexisting knowledge or habits that would otherwise represent formidable barriers to new learning.' (Newstrom 1983: 36)
Nystrom and Starbuck	1984	'Before organizations will try new ideas, they must unlearn old ones by discovering their inadequacies and then discarding them.' (Nystrom and Starbuck 1984: 53)
Prahalad and Bettis	1986	'Unlearning is simply the process by which firms eliminate old logics and behaviours and make room for new ones.' (Prahalad and Bettis 1986: 498)
Starbuck	1996	'Unlearning is a process that shows people they should no longer rely on their current beliefs and methods.' (Starbuck 1996: 727)
Becker	2005	'Unlearning is the process by which individuals and organisations acknowledge and release prior learning (including assumptions and mental frameworks) in order to accommodate new information and behaviours.' (Becker 2005: 659)
Cegarra-Navarro and Dewhurst	2006	'Organisational unlearning […] is defined as the dynamic process that identifies and removes ineffective and obsolete knowledge and routines, which block the collective appropriation of new knowledge and opportunities.' (Cegarra-Navarro and Dewhurst 2006: 51)

some referring specifically to individual or organisational unlearning, while others can be applied at either level.

These definitions display several commonalities: They suggest an elimination or at least reduction of knowledge; they also imply that a process is occurring rather than a single event; and finally, most acknowledge the strong connections between learning and unlearning. Some imply the need to unlearn before attempting to adopt new ways, whereas others see these two activities happening simultaneously.

Differentiating Unlearning

In defining unlearning, it is also relevant to acknowledge that questions have been raised about unlearning as a standalone construct, and whether it is worth pursuing as a concept in and of itself. For example, Huber (1991: 104) suggests that 'unlearning is conceptually subsumable under learning. Use of the word "unlearning" serves primarily to emphasize a decrease in the range of potential behaviours, rather than to indicate a qualitatively different process.'

Unlearning and learning have always been closely aligned; however, there has also been discussion of constructs that might be considered close to (or indeed equivalent to) unlearning—in particular, the concept of forgetting. Forgetting is often used in conjunction with or instead of unlearning. However, the term 'forgetting' in common usage refers to ceasing to remember, usually unintentionally, whereas unlearning implies an intentional action—either for the individual or the organisation. Martin de Holan and Phillips (2004) have undertaken extensive work in organisational forgetting and have identified that organisational forgetting can be intentional or accidental, and can relate to long-held beliefs and knowledge or recently acquired knowledge. They argue that organisational forgetting can be beneficial or detrimental depending on whether the knowledge was desirable (Martin de Holan et al. 2004). Therefore, unlearning is equated with the purposeful or intentional forgetting of knowledge that is seen as detrimental to the organisation (Martin de Holan et al. 2004).

Researchers in psychology have also studied individual forgetting and discussed its relationship with the concept of unlearning. In a study of extinction, lapse and relapse, Bouton (2000) suggests that even though individuals may forget, lapse and relapse can occur with manipulation of the environment in which an individual finds themselves. This implies that extinction does not typically involve the total removal of knowledge, but it will reduce the use of knowledge in certain contexts. Some models of unlearning consider this same issue and will be discussed in the next section.

Models and Theories of Unlearning

There is no single model of unlearning, however Hedberg (1981) and Nystrom and Starbuck (1984) are recognised as early authors working in the field. Hedberg (1981) suggests that learning and unlearning happen simultaneously and that new knowledge typically replaces old knowledge; in a sense, 'overwriting' previous knowledge. It is proposed that unlearning may be triggered by the organisation either experiencing problems or identifying opportunities, leading it to question current ways of operating. Movement of key individuals within the organisation, or their exiting from the organisation, may also act as a catalyst for unlearning. Being incapable of unlearning is argued by Hedberg (1981) to be a critical weakness of organisations.

Nystrom and Starbuck (1984) were also instrumental in furthering the discussion on the importance of unlearning for organisations. They suggest that organisations need to identify areas of 'blindness and rigidity' (Nystrom and Starbuck 1984: 53) in order to continue to develop. Their suggestion is that as organisations grow, they often become complacent and are not open to signals that might indicate inadequacies in existing knowledge. Thus, it is argued that such organisations may face crises that highlight the weaknesses in existing knowledge, forcing organisations (and individuals) to consider relinquishing past beliefs and values and be open to new ideas (Starbuck 2017).

In contrast to both Hedberg (1981) and Nystrom and Starbuck (1984), Klein (1989) suggests that unlearning is not as easy as simply replacing old knowledge with new knowledge. In what is referred to as 'parenthetic learning', Klein (1989) posits that old knowledge is not discarded but is retained, and that unlearning involves realising when new responses are more appropriate than previous ones (in effect suggesting that old responses are retained in parentheses). This model proposes that a new response replacing an old one is not necessarily, in and of itself, an improvement for the organisation. Klein (1989) argues that the ability to identify contexts in which new responses are more appropriate than past responses is the key to successful change.

Another model of unlearning is offered by Newstrom (1983: 37), arguing that learners 'do not have a clean slate, but a deeply entrenched behavioural pattern that has been reinforced for years'. The amount of unlearning required to change this behavioural pattern is presented as being affected by the nature of the new knowledge or the learning that needs to occur. Newstrom suggests that if the learner is learning something entirely new, adding a new behaviour to an existing repertoire or sustaining a previous behaviour, then unlearning

is not a significant issue. However, if trying to change the extent to which they use a skill or behaviour (either increase or decrease), then unlearning will be moderate; and at the highest level, when trying to replace one behaviour with another, the need for unlearning will be significant.

Individual Knowledge, Learning and Unlearning

We are living in a knowledge era, and many employees are now considered to be knowledge workers (Alvesson 2004), relying heavily on their expertise to succeed in the workplace. However, all workers, blue collar and white collar alike, build knowledge over time to enhance their capabilities. Thus, the knowledge held by employees has been recognised as critical for organisations and has therefore received significant focus, along with the need to continually refresh and renew this knowledge. In this context, unlearning becomes critical. However, it has also been argued that those who are considered 'experts' in their field may be most resistant to unlearning due to their extensive experience (Starbuck 1996).

All adults have experiences, knowledge and ways of seeing the world upon which they draw, even when learning something new. Adult learning theory (for example, the work of Knowles (1990) relating to andragogy) argues that previous knowledge and experience should be valued and drawn upon to aid the learning process for adults. However, it has also been argued that this knowledge may be the very thing that holds a learner back (Newstrom 1983; Nystrom and Starbuck 1984).

Sometimes what individuals believe that they know may be wrong (incorrect facts or procedures that cause repeated errors), but sometimes there is a less obvious distinction than 'right or wrong' in terms of the knowledge holding individuals back. Individuals may not have all relevant information, or may be interpreting the information available to them in ways that are unhelpful. Learning and unlearning are inherently linked and, therefore, it is important to consider some of the key learning theories and the implications that they may have for unlearning.

Individual Learning Theories and Unlearning

Understanding some of the learning theories upon which contemporary understandings of knowledge have been built can assist to further comprehend unlearning. Knowles (1970) argues that any approach to facilitation of

learning for adults must recognise the existence of prior knowledge and utilise this as an integral part of the learning process. However, when considering unlearning, it is also important to identify the prior knowledge that may not be helpful to draw upon when acquiring new knowledge or building new skills. Facilitators of learning thus need to develop ways to ensure that unlearning becomes an integral part of the learning process.

Bateson (1972), an early theorist of learning, proposes the concept of deutero-learning, that is, the importance of learning how to learn. In a similar vein, Argyris and Schon (1978) propose that individuals (and indeed organisations) can learn through failure and errors, and can engage in either single-loop or double-loop learning. Single-loop learning typically involves simple identification and correction of errors. Double-loop learning, however, requires an analysis of underlying knowledge, processes or assumptions that may contribute to an error or negative outcome. This type of learning requires a deeper engagement with knowledge (and particularly assumptions) to allow for double-loop learning. Sun and Scott (2003) argue that this type of learning requires learners to discard obsolete knowledge, and it has been argued that unlearning is indeed an important part of double-loop learning (Visser 2017).

The concept of triple-loop learning has also been proposed as the step beyond single-or double-loop learning (for example, see Foldy and Creed 1999; Romme and Witteloostuijn 1999; Snell and Chak 1998). Snell and Chak (1998: 339) define triple-loop learning as developing 'new processes for generating mental maps'; not just questioning underlying knowledge or assumptions but also interrogating how these were developed in the first place. The distinctions between not learning, single-, double- and triple-loop learning are shown in Table 5.2, along with suggestions of the implications of each type of learning for unlearning.

Another widely recognised theory of learning relates to the role of experience. The experiential learning model developed by Kolb (1984), based on Dewey's model of learning, Lewin's model of experiential learning and Piaget's model of learning and cognitive development, has been widely applied to learning situations. Experiential learning is defined as 'a holistic integrative perspective on learning that combines experience, perception, cognition, and behaviour' (Kolb 1984: 21). Typically, experiential learning is suggested as occurring in an ongoing cycle of experience, observation, abstraction and testing of new knowledge or approaches. Therefore, if unlearning is a requirement of learning, it would be assumed that action learning must include experiences that require individuals to reflect upon underlying assumptions and perceptions as

Table 5.2 Levels of individual learning and implications for unlearning (based on Snell and Chak 1998: 340)

Level of learning	Manifestation for individuals	Implications for individual unlearning
Not learning (zero)	Isolation—failure to receive feedback on actions, failure to take in any new information.	Unlearning will not occur.
Single loop	Adapting—becoming more skilful; registering that one's actions are not achieving their goal, adjusting one's actions to increase the possibility of achieving the goal.	Unlearning not likely as underlying knowledge is not being questioned.
Double loop	Developing—choosing to learn different kinds of skill: understanding why one's prior meaning-making or goal-seeking systems were inadequate and led to incongruities and omissions. Reframing problems from a position of deeper insight.	Unlearning likely when questioning why prior knowledge or approaches are inadequate.
Triple loop	Inventing—becoming aware of the limitations of all grand frameworks; creating ways of coming up with new structures of thought and action suitable for particular occasions and monitoring the effects of these frames.	Unlearning essential to understanding how previous knowledge and frames developed in order to challenge previous knowledge or approaches.

a part of abstraction in order to begin to question existing ways of thinking and behaving.

Mezirow (1990: 1) also emphasises the role of experience and defines learning as 'the process of making a new or revised interpretation of the meaning of an experience, which guides subsequent understanding, appreciation, and action'. It is suggested that the highest level of learning—transformative learning—occurs when an individual faces a 'disorientating dilemma' and is forced to examine previously held assumptions and beliefs, and often to change their perspective. Therefore, individuals need ways to challenge these beliefs and assumptions and to consider alternative perspectives in order to learn; and, as a part of this process, unlearning will be essential to releasing these perspectives and facilitating openness to learning.

Action learning has long been advanced as an experiential approach to learning through practice and experience, and involves learning from actions taken to address problems and then reflecting upon the outcomes (Revans 1980). Since the turn of the century, the link between action learning (and

particularly 'critical action learning' that promotes critical reflection) and unlearning has been made. Brook et al. (2016) argue, based on an empirical study, that the experience of dealing with 'wicked problems' (defined as involving ambiguity, complexity and new challenges without accepted solutions), means unlearning is critical to challenging existing responses and acting differently or, in some cases, refraining from action.

It has also been suggested that individual unlearning may occur at two different levels for individuals: behaviourally or cognitively (Hislop et al. 2014). Behavioural unlearning typically refers to individuals letting go of past practices or behaviours in order to adopt new ways of working. This type of unlearning may not have any significant impact on the underlying assumptions and beliefs of the individual and therefore not involve emotional elements of unlearning. In contrast, cognitive unlearning requires individuals to question beliefs, values and assumptions and therefore involves far more profound unlearning; it is thus a process referred to as deep unlearning (Hislop et al. 2014; Rushmer and Davies 2004). Underlying cognitive unlearning, in particular, is the recognition that individuals carry knowledge and ways of knowing that influence how they think and learn about the world around them, and subsequently their ability to adopt new ways of doing so, sometimes referred to as changing frames of reference.

Mezirow (2000) suggests that it is frames of reference that shape how individuals perceive, feel and think about the world. Other terms can be found, such as cognitive structures (Nystrom and Starbuck 1984), cognitive maps (Huber 1991), mental models (Kim 1993), schemas (Barrett et al. 1995) and cognitive style (Sadler-Smith 1999). These structures are seen to manifest themselves through 'perceptual frameworks, expectations, world views, plans, goals, sagas, stories, myths, rituals, symbols, jokes, and jargon' (Nystrom and Starbuck 1984: 55), and these will change if individuals engage in cognitive unlearning. However, it is widely acknowledged that these frames of reference have been reinforced over time and therefore may be an obstacle to unlearning. For unlearning to occur, there is a need to change mental models and, for that, individuals must let go of things that they believe to be true and be prepared to question their current frames of reference. In order to facilitate such questioning, there needs to be mechanisms to surface these mental models in order to challenge them. Therefore, a key consideration in any learning or change process will be to address the existence of previous knowledge and ways of working that are inhibiting the acquisition of new knowledge.

Psychological and Educational Perspectives on Unlearning

While unlearning has moved into the educational and organisational literature, it roots can be traced back to psychology, with reference to unlearning in early memory and cognition literature (Postman and Underwood 1973). Interference theory, in particular, has a long history in psychology (for an early example, see Melton and Von Lackum 1941), focusing on the existence of knowledge and the extent to which this may interfere with learning. In particular, proactive inhibition is a type of interference whereby the existence of previous knowledge inhibits the acquisition of new knowledge (Melton and Von Lackum 1941), and reference to the link between proactive inhibition and unlearning can be found in this literature (for example, see Postman and Underwood 1973).

Beyond psychology, an application of proactive inhibition emerged in the field of education, championed by Lyndon (1989) and was applied specifically to remedial teaching of children. Lyndon claims that when addressing errors or incorrect knowledge, 'they are confronting a problem of knowledge, not its absence' (1989: 33). Lyndon argues that when errors occur, proactive inhibition is preventing the transfer of knowledge, as it works to protect the knowledge already acquired, and especially to avoid the association of conflicting ideas, and impedes the recall of new knowledge that conflicts with pre-existing knowledge. Drawing on this phenomenon, Lyndon (1989) offers an approach to teaching called 'Old Way/New Way', suggesting that previous knowledge must be acknowledged as a part of the learning process to accommodate the acquisition of new knowledge.

Drawing upon the method of 'Old Way/New Way' and proactive inhibition, Baxter et al. (1997) conducted field trials of a teaching approach called Conceptual Mediation, and applied it to vocational education and training, where it has been used to correct either physical or cognitive skills or behaviours. Field trials of Conceptual Mediation show that error rates are reduced, and that speed and retention of learning are enhanced by using this technique which overtly recognises 'old knowledge' as a part of the learning process.

There is also the psychological phenomenon known as cognitive dissonance, which suggests that individuals may experience a level of discomfort from holding two or more pieces of knowledge, attitudes or behaviours that are in conflict (Festinger 1957). In such instances, this discomfort will typically be resolved by the individual either ignoring or discarding new knowledge, or by the individual devaluing or releasing past knowledge (Perlovsky

2013). This aligns with the idea of transformative learning (Mezirow 1990: 4), where it is also argued that 'when experience is too strange or threatening to the way we think or learn, we tend to block it out or resort to psychological defense mechanisms to provide a more compatible interpretation'.

The field of social psychology continues to study cognitive dissonance, but it has also had widespread recognition in the field of management, with citations of cognitive dissonance continuing to rise in top-tier management journals (Hinojosa et al. 2017) relating to topics such as resistance to organisational change (Peccei et al. 2011), work and family role conflicts (Greenhaus and Powell 2003), job satisfaction (Wang and Hsieh 2014), risk and decision-making (Beasley 2016), and performance feedback discrepancies (Brett and Atwater 2001). It is apparent that cognitive dissonance provides a useful lens through which to consider unlearning. It draws attention to the potential impact of previously held beliefs and assumptions, and the possibility that individuals will act to either change their perspective, which would facilitate unlearning, or to develop defence mechanisms to protect existing knowledge and hence resist unlearning.

Organisational Knowledge, Learning and Unlearning

Beyond individuals being able to learn, it is acknowledged that collectives can also learn and possess knowledge. The discussion of organisational learning and the more applied concept of the learning organisation were born out of the acknowledgement that sometimes knowledge is held collectively and represents knowledge beyond that of a single individual. Much of the research and discussion of such collective knowledge has been aimed at the firm or organisational level but can equally be considered at the group or team level (Zhao et al. 2013). This phenomenon recognises that groups can also possess knowledge that may not necessarily represent the entire organisation but nonetheless has significant impact on members of the group. Therefore, it is important when considering unlearning to look not only at how individuals unlearn but how organisations and other collectives unlearn.

Successful businesses have business models and ways of operating that have made them effective over time. However, sometimes it is the very things that have made them successful that, in the longer term, may represent threats to their ongoing sustainability. If they are unable to sense when assumptions, collective beliefs and ways of operating need to change, they may face erosion

of market share, and competitors (or worse still, disruptors) may enter the marketplace and change the rules of the game. Organisational failures are often a result of managers relying on past actions and behaviours that have helped them succeed to date and as a result they will misinterpret events, or worse deny that changes are occurring in their environment (Nystrom and Starbuck 1984). Hamel and Prahalad (1994) urge managers and organisations to 'unlearn the past' and argue that 'learning to forget' is a critical issue for organisational survival. Likewise, it has been argued that we should not only strive to develop a learning organisation but to also develop the unlearning organisation (Sherwood 2000; Tsang 2017). This need has become even more relevant in today's rapidly changing business landscape. Organisational learning is a common consideration, however, organisational unlearning is far less widely acknowledged or discussed and will be covered in the next section.

Nokia: A Case Study of the Need for Organisational Unlearning

History presents many examples of organisations that did not sense a change in their environment and consequently moved rapidly from high performance to struggling for survival. It is often suggested that the more adept an organisation is at what they do, the less likely they are to question ways of working or doing business. This could certainly be argued to be the case for Nokia. In 2007, Nokia held 49.4% of the cell phone market share but plummeted to just 3% in 2013 when it was purchased by Microsoft (Lee 2013). Ironically, the history of Nokia shows that it had certainly been successful in the past at reinventing itself, having previously been a manufacturer of rubber boots and car tyres (Lee 2013). However, it could be argued that because of such success, the organisation became reliant on well-established ways of operating in an environment and market sector that was rapidly changing. Indeed, during the press conference to announce the Microsoft purchase, the CEO, Stephen Elop, is quoted as saying 'we didn't do anything wrong, but somehow, we lost'. This case provides a striking example of the need for organisations to continue to unlearn past ways of operating and question what they do and how they do it, even when they are successful market leaders.

Organisational Unlearning

Organisations are typically set up to link individuals together, with the aim of ensuring that everyone is working towards a common vision and shared goals. Over time, organisations amass knowledge and can 'learn' about appropriate ways to deal with situations that arise, and thus organisational learning has for some time been acknowledged as critical for all organisations

(Argyris and Schon 1978; Fiol and Lyles 1985; Huber 1991; Levitt and March 1988). There is now recognition that as well as being able to learn new ways of achieving outcomes, organisations need to be able to let go of past knowledge and practices that may hinder attempts to change the way they do things.

In the same way that levels of learning apply to individuals unlearning, the model presented by Snell and Chak (1998) can also be applied to unlearning at the organisational level. Table 5.3 presents the levels of learning (from no learning to triple-loop learning) and considers the implications for organisational unlearning.

As Table 5.3 indicates, organisational unlearning becomes particularly critical when double- or triple-loop learning is required, and indeed a recent study has shown the importance of unlearning for double-loop learning for organisational success (Wong et al. 2012). When organisations need to question their underlying assumptions and norms to address challenges that arise, they must unlearn previously accumulated knowledge and learning.

Table 5.3 Levels of organisational learning and implications for unlearning (based on Snell and Chak 1998: 340)

Level of learning	Manifestation for organisations	Implications for organisational unlearning
Not learning (zero)	Fragmentation—no linkage between individuals' mental models and shared mental models. Loss of the individual means loss of that person's expertise.	Organisational unlearning will not occur.
Single loop	Consolidating—adding to the firm's knowledge and competency base without altering present policies, present objectives, present mental maps or basic activities.	Organisational unlearning is unlikely, as existing knowledge has not been questioned nor physical manifestations of this knowledge been altered.
Double loop	Transforming—changing the firm's knowledge and competency base by collectively reframing problems, developing new shared paradigms or mental maps, modifying governing norms, policies and objectives.	Organisational unlearning is likely when questioning and reframing why prior knowledge or actions are not effective.
Triple loop	Co-inventing—collective mindfulness. Members discover how they and their predecessors have facilitated or inhibited learning, and produce new structures and strategies for learning.	Organisational unlearning is critical to question how existing frames have developed and provide opportunities for discarding obsolete or ineffective knowledge.

The literature on organisational forgetting (for example, see Easterby-Smith and Lyles 2011; Martin de Holan and Phillips 2004), particularly where considering forgetting that is purposeful and beneficial, is closely linked to the concept of organisational unlearning. In a review of literature on these topics, it has been suggested that three different perspectives have been taken on considering organisational forgetting and unlearning (Easterby-Smith and Lyles 2011; Tsang and Zahra 2008): cognitive, behavioural and social. The cognitive perspective considers how organisations absorb and embed knowledge within the organisation, often combining tacit and explicit knowledge, and focuses on organisations attempting to capture such knowledge, frequently through policies and procedures (Easterby-Smith and Lyles 2011). The focus on unlearning from this perspective therefore considers how to surface such knowledge and question how it may be interfering with the organisation's ability to adapt to changing circumstances or respond to challenges in its environment.

The behavioural perspective suggests that experience plays a key role in organisational forgetting and unlearning and that while ongoing experience can build capability in an organisation, it can also serve to embed routines that, in the longer term, may be detrimental to attempts to change (Easterby-Smith and Lyles 2011; Fiol and O'Connor 2017). This entails a focus on the importance of identifying behaviour that serves to restrain organisational responses, in an effort to change behaviour.

Finally, the social perspective focuses on the role that interaction between individuals plays in the establishment of bonds and connections that create and share knowledge, emphasising that unlearning requires the acknowledgement of social networks that may assist or hinder such processes (Easterby-Smith and Lyles 2011). The social perspective suggests that there are many forces that shape organisation decisions and actions and these typically are a result of the individuals within the organisations interacting and reaching shared agreements on ways of working.

Organisational Memory and Unlearning

Just as individuals can recall facts and events, it has been acknowledged that organisations also exhibit what has been referred to as an organisational memory. Stein (1995: 17) defines organisational memory as organisations having 'the means to retain and transmit information from past to future members', and argues that organisational memory has significant implications for organ-

isational learning and unlearning. Easterby-Smith and Lyles (2011) suggest that the cognitive perspective on unlearning and forgetting links closely with the concept of organisational memory, positing that organisations hold knowledge and information that might inhibit future learning. It is argued that 'on one hand, memory development enables learning from experience, while on the other hand, memory can constrain the search for and creation of future possibilities […]. Simply, memory has inertia that can constrain future organizational change' (Berthon et al. 2001: 138).

Organisational memory is considered to include both tangible elements such as standard policies and procedures, and intangible elements such as mental models (Paoli and Prencipe 2003); or as Tsang and Zahra (2008) differentiate, human and nonhuman forms of memory storage. These distinctions are similar to explicit and tacit knowledge at the individual level, and each of these can have potential implications for organisational unlearning.

Explicit Organisational Knowledge and Unlearning

Organisational knowledge and learning is captured explicitly in many ways in organisations; in policies and procedures, practice, structures and even organisational assets. These elements are often referred to as artefacts (Schein 2010) and are viewed as the carriers of past experience and learning as well as an embodiment of the organisation's culture. Martin de Holan (2011) believes that assets (for example, physical assets such as buildings) are at the core of an organisation and are often tangible representations of the resources upon which the organisation draws to produce a return. These assets frequently remain stable over time and reflect a key way that such organisations embed knowledge.

Structure is also argued to be a physical manifestation of organisational knowledge (Martin de Holan 2011) and divides the work of the organisation into separate elements that have significant influence over how work is done and the interactions that occur within the organisation. Therefore, if unlearning is to occur, organisations must consider how these structures perpetuate past ways of doing things, and should provide opportunities for different interactions. Often, organisational restructuring is seen as a way to break down barriers to facilitate unlearning and open the organisation to new ways of working.

Organisational knowledge is also captured in policies and procedures in an organisation. Again, these represent explicit reflections of learning and adaption

that has occurred over time in the organisation and are usually nonhuman ways of representing organisational memory. These policies and procedures remain as enduring evidence of prior learning and embed particular ways of working into the everyday operations of the organisation.

Tacit Organisational Knowledge and Unlearning

Organisations not only hold explicit knowledge but also possess tacit knowledge, typically held by the people and networks within the organisation. Organisations are believed to be 'characterised by knowledge structures, frames of reference, givens, causal maps, shared mental models, and the like, through which they perceive, categorise, and give meaning to events. These mechanisms act as filters in the process of assimilation of new information. Moreover, they have a bearing on and actually constrain decision-making processes as well as the generation of actions' (Paoli and Prencipe 2003: 148). In its broadest sense, organisational culture is seen to be the carrier of collective tacit knowledge or organisational memory (Balogun and Jenkins 2003; Walsh and Ungson 1991). Organisational culture is also an important consideration when seeking to understand organisational unlearning. In effect, organisational culture can prohibit considering alternative ways of handling situations and may limit an organisation's effectiveness in dealing with new or different situations, or indeed similar situations in a changing organisational context and environment.

It is often acknowledged that organisational culture encompasses a wide range of factors, including norms, behaviours, assumptions and other taken-for-granted beliefs that guide organisational actions (Cameron and Freeman 1991; Goodman et al. 2001; Schein 1996). Culture is often believed to have a positive role to play in organisations, representing the learning from past experience that can assist organisations to handle similar circumstances in the future (Walsh and Ungson 1991). However, it could also be suggested that this knowledge may lock organisations into ways of acting that could potentially impede them in the future, falling into what has been described as the 'competency trap' (Levitt and March 1988) or 'competency barriers' (Markoczy 1994). Just as experts who have amassed a large amount of experience and knowledge may find it difficult to unlearn, organisations that have been successful in the past may find unlearning a challenge.

Organisational routines have also been seen to represent a repository for organisational knowledge and memory. Many have suggested that these routines develop over time and are used by organisations to yield predictable

results (Akgun et al. 2007; Martin de Holan 2011; Sinkula 2002). Bessant et al. (2014) posit that to radically innovate in today's volatile and uncertain environment, there is a critical need for organisations to have the capability to reframe and unlearn past routines.

At the deepest level, there is recognition that not only do organisations have established routines, but these are often based on deeply embedded assumptions, mental models and unspoken rules, of which many in the organisation are not even aware. These have been referred to as understandings (Martin de Holan 2011), dominant logic (Prahalad and Bettis 1986) or basic underlying assumptions (Schein 2004). They are generally taken for granted and their use is often unacknowledged, but they can have a profound effect on how organisations make decisions and behave and therefore need to be challenged and unlearned if an organisation is to remain effective.

So, collectively, organisational culture and all its elements have the potential to significantly impact the ability of an organisation to unlearn. However, it is important to note that culture in and of itself may not make an organisation more resistant to unlearning; indeed, if an organisation engenders a culture of adaption and agility, it may mean that the culture facilitates organisational unlearning.

Key Individuals and Organisational Unlearning

Although there is a move to focusing on the importance of teams in organisations, there is still recognition that key individuals, particularly leaders, will have a profound influence on the unlearning ability of the whole organisation. Leaders, either formal or informal, can play a critical role in organisational learning, unlearning and knowledge management because of their influence on those around them. Many have argued that managers carry a range of assumptions and biases, and that there is a need for managers and leaders to be willing to unlearn these frames of reference to facilitate organisational change. Prahalad and Bettis (1986) suggest that managers represent a 'dominant coalition' that can sometimes hinder unlearning within the organisation and Markoczy (1994) states that managers have amassed knowledge in particular organisational routines and have gained legitimacy in the application of particular belief systems and routines and so are resistant to organisational change. Therefore, any organisation needing to change and adapt will have to consider carefully how to facilitate unlearning in its managers and thought leaders to ensure that organisational unlearning can occur.

Industries, Occupations and Unlearning

Beyond the boundaries of organisations, there are other collectives such as industries and occupations that may possess their own knowledge and ways of doing things that are entrenched and which govern how individuals behave—a concept referred to by Schein (2010) as a macroculture. It is suggested that occupations, particularly those professions that require extensive training conducted over an extended period, and involving extensive socialisation and identification as a profession, can possess their own ways of doing things that endure, regardless of the organisation in which an individual works. For example, in the field of prosthodontics (a specialised area of dentistry focused on producing and installing artificial teeth and mouth parts), Sadowsky (2016) challenges those in the profession to question why the adoption of new techniques and the acceptance of a range of new biomaterials has taken some time, despite research to support these innovations. He suggests that unlearning within the profession will be critical for the future in an age where innovation is accelerating. In a similar vein, Rushmer and Davies (2004) suggest that health care has deeply entrenched and accepted practices which have a long history. They believe that there are some 'deep rooted', established and widely accepted clinical practices that require unlearning if health care advancements are to be made, and there is a significant and emotional attachment to some of these practices previously considered to be 'fact'.

Moreover, there are many industries that provide examples of the need to unlearn prevailing models and methods of operating. In recent years, the rapid rate of advancement in technology has changed the landscape of many industry sectors, with media being a pertinent example. Although there may be differences across countries, there is little doubt that the media business has changed dramatically; traditional newspapers are in decline and audiences are turning to a wide range of digital sources for news and current affairs (Nielsen 2015). While this is just one industry that has fundamentally changed due to the emergence of new technology, it is also an example of how an industry needed to unlearn in order to survive. However, in recognising a significant shift in their environment, it is claimed that some of the responses, including selling off rights to news content that was subsequently provided for free, did not assist the industry to adapt and in fact may have hastened its decline (Farhi 2009). This may be a case of an industry (or at least elements of it) failing to recognise that it needed to question underlying assumptions, routines and ways of doing business in order to be able to adapt to a step change in the environment.

Implications for Practice

Many of the definitions of unlearning emphasise the need to 'let go' of something currently held—knowledge, assumptions, myths, ways of working—but this is not necessarily easily achieved. Understanding the importance of unlearning and the need for it—in individuals, organisations, occupations and industries—only begins the conversation. The key challenge for organisations is to develop ways to facilitate unlearning both in individuals and across the organisation. There are a range of approaches offered to facilitate and support unlearning in the workplace, and these have been summarised below.

Respect Past Practice It is important to acknowledge that something is being 'lost' and to be aware of how individuals may react in different ways to this loss. Unlearning must not be assumed to simply be a cognitive or behavioural process but one that potentially involves emotional elements. This emotional element of unlearning must be taken into account in efforts to challenge and change assumptions and ways of working. Although past ways of working may now be considered inadequate to meet the needs of a changing world, nonetheless it is critical to respect the value of past practice and the contribution that it has made to achieving current results. Therefore, in introducing change, the knowledge being unlearnt must be acknowledged rather than dismissed (or worse still, ignored), and the emphasis can then turn to reinforcing how the 'new way' is beneficial to conserving an overall direction or purpose that the previous practice began.

Reward Those Challenging the Status Quo If unlearning requires questioning past assumptions, and challenging ideas at every level, then it is important to build a culture of unlearning and openness to experience, and to encourage responsible risk-taking. This can be a difficult task if policies and practices, and entrenched ways of working do not reward such behaviours. Policies and procedures, and importantly human resource management practices, such as performance management, that may work counter to challenging the status quo need to be reviewed. If key goals and rewards for individuals or teams are focused around outcomes such as efficiency and productivity with no encouragement to innovate (which in the short term may have a negative impact on such outcomes), then there is a disincentive to try new ways of working. In addition to reinforcing behaviour that questions existing assumptions and processes on an ongoing basis, issuing the challenge of questioning current practice and identifying potential innovations to a wide range of internal

stakeholders through explicit activities such as innovation contests has also been advocated as a way to encourage unlearning (Bessant et al. 2014).

Welcome Outside Perspectives Stable organisations are often those that become most resistant to unlearning. They have established ways of operating and, as these have made them successful, they see little need for change. Particularly for these organisations, but for most others too, it has been suggested that gaining external perspectives is critical (Bessant et al. 2014). Getting close to the entire value chain—suppliers, customers, competitors and the community alike—provides organisations with the opportunity to seek new perspectives and additional input.

There is also a need to look at new employees in a different way. Perhaps rather than considering their induction as a way of socialising them and showing them existing ways of working, they should be viewed as presenting an opportunity to challenge pre-existing models and frames of reference. There is also the rapid growth in the use of freelancers and independent contractors in organisations (Meager 2016). They represent new challenges to organisations but may also provide a unique opportunity for outside perspectives, as they work with multiple organisations and are exposed to diverse ways of working.

The diversity literature has long espoused the value of diversity in all its forms as a way of bringing new and different perspectives to the workplace (DeGrassi et al. 2012; Rink and Ellemers 2010). More recently, the use of 'reverse mentoring' has been advocated as a way for older workers to learn from younger workers (Chaudhuri and Ghosh 2012; Marcinkus Murphy 2012), often due to different expertise with technology (engaging with the discussion of digital natives versus digital immigrants (Prensky 2001)). However, beyond digital literacy, diversity in all its forms is critical to facilitate unlearning, as different perspectives bring the ability to view problems from different standpoints and challenge underlying assumptions.

Seek Feedback Organisations have long been implored to seek feedback as a way of challenging current practice (Starbuck 1996). Whether internally or externally, asking for feedback enables organisations to reflect on their operations and underlying processes. Many organisations routinely seek feedback from customers, suppliers and employees. However, the extent to which this information is used to inform decision-making and question current processes and assumptions may vary significantly. By seeking (and most importantly using) feedback, organisations can open themselves up to unlearning current ways of operating that may not be optimal for ongoing high performance.

Find Learning and Unlearning Opportunities in All Situations It is also important that unexpected events, disagreements and warnings are seen as flagging potential opportunities to unlearn (Starbuck 1996). Dismissing such situations may be missing an important indication that unlearning is required. When crises occur or mistakes are made, these often present a unique opportunity to analyse the underlying assumptions, mental modes, accepted ways of operating and frames of reference that may have led to less than effective outcomes, and identify more appropriate ways to respond in future.

View Situations as Experimental Finally, it is often suggested that when individuals are encouraged to see something as 'experimental' or as a trial, they are more likely to be willing to let go of past practices and try something new (Nystrom and Starbuck 1984). Organisations that show a willingness to test new ideas and ways of working, and to seek feedback to refine these are likely to find more willingness in individuals to commence the process of unlearning.

Conclusion

Unlearning is receiving growing recognition as a key part of knowledge management, organisational learning and change. Unlearning challenges organisations to acknowledge how current policies, practices, assumptions and ways of operating may limit the ability to adapt to their changing environment. Likewise, individuals need to be able to identify when existing knowledge may be inhibiting their effectiveness and identify ways to change not only their behaviour but to question what they have previously accepted. In a world that is rapidly changing with the impact of technology, globalisation and social pressures, unlearning for both individuals and organisations will only continue to grow in importance.

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6

Knowledge Management and Organisational Culture

Oliver G Kayas and Gillian Wright

Knowledge management exists to make the most of knowledge in an organisation. It is concerned with identifying and leveraging the collective knowledge to provide an organisation with a competitive advantage (Alavi and Leidn 2001). The use of knowledge is the point, not the knowledge or knowledge management per se. This implies that knowledge can be used to improve the performance of an organisation, and so when we talk about knowledge management there is an implicit emphasis on organisational change in general, and specifically on changing organisational culture (Massaro 2015). To this end, knowledge management has evolved from an interest in information management, through an emphasis on knowledge-sharing and more recently to ways of understanding the impact of knowledge management on organisations and their culture (Holste and Fields 2010). Attempts to change organisational culture are intended to lead to continuous improvement, with a view to increasing competitive advantage (Chang and Lin 2015; Li et al. 2013). In this content, knowledge management is a means to organisational learning (Allameh et al. 2011).

The case for knowledge management is often made a strategic level. The drivers, however, are in fact more prosaic, and result from two dramatically opposite approaches to overall organisational approaches. Margins are central to viability and profitability; they are maintained through the different strategies of cost control and added value. Ironically, knowledge management is seen to be a panacea for achieving both. If cost control and associated price

O. G Kayas (✉) • G. Wright
Manchester Metropolitan University Business School, Manchester, UK

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leadership is the core organisational strategy, then knowledge management is considered by management as the means by which production and cost control is achieved. In a value strategy, knowledge management provides information that is concerned with the maintenance of quality of the offering. Both have the same effect in practice—they provide management information on operations that allows for the sanctions and rewards of staff based on monitoring their performance. This techno-surveillance of the workforce becomes an artefact; it impacts espoused value and affects assumptions, thus influencing organisational culture. Knowledge management systems (KMS) report on many aspects of performance relating to the efficiency of the workforce, and the information that they generate can be used as the basis to impose sanctions. Ultimately, this can also make those that are no longer deemed necessary redundant or can change the way that they work, in order to enhance their performance.

In this chapter, we draw on a combination of the extant literature and our own organisational case study to discuss aspects of knowledge management and organisational culture.

The case study is an exploration of the implementation of a KMS in a public authority, referred to as Authority Alpha. We use it here as an example of the nature and impact of the implementation of a KMS on the workforce and management activity and attitudes. We draw on the implementation, the changes and the impact on organisational culture that resulted from the introduction of this radical new approach.

The organisation, which provides a wide range of public services, introduced a KMS in the form of an enterprise system because it was deemed to be under-performing. The services provided by the organisation include: welfare advice; business services; community services; education; environment and planning; health and social care; housing; jobs and careers; leisure and culture; and transport and highways. The under-performance was attributed to the workforce and this assumption underpinned the introduction of the KMS; thus, it was implicit that that the surveillance was introduced to control workers' behaviour and maximise performance.

We establish first why organisational researchers are interested in the relationship between organisational culture and knowledge management. Next, we address organisational culture, its key relationship with knowledge-sharing, and the wider relationship between technology and culture. We then go on to discuss the relationship between KMS and performance management, followed by the impact of the KMS on the culture of an organisation.

Knowledge Management Systems and Organisations

The purpose of KMS is to support the creation, transfer and application of knowledge in organisations (Alavi and Leidn 2001). They are IT-based information systems designed to integrate and codify knowledge throughout the adopting organisation. Knowledge is typically shared through a centralised database, which all areas of the organisation can access, manipulate and update (Alavi and Leidn 2001; Davenport 2000), enabling real-time access to organisational knowledge across diverse organisational functions, units and geographic boundaries. In this chapter, KMS refers to the entire enterprise-wide system and the technology underpinning it, as well as the adopting organisation's social context.

Organisations have used the adoption and implementation of KMS as an occasion for change, renewal and restructuring that is often the source of problems and tensions. Knowledge management systems have been shown to facilitate change and underpin the enabling of organisational performance (Bloomfield and Hayes 2009), and importantly they also inculcate—often extreme—surveillance through enforced sociotechnical interactions. This surveillance can take various forms: it can be rendered through the information technology architecture; it can be exercised covertly or overtly; it can be deployed through a vertical hierarchy in which managers observe workers; it could be a self-surveillance system; or it could instil power in people to control or empower others. These various forms of surveillance can have major impacts on organisational culture. From an organisational management point of view, control in the workplace becomes increasingly important when people are viewed as the main problem in productivity. Employers have sought to regulate, direct, constrain, anchor and channel activity for the purposes of sustained, often repetitive, productive activity (Zuboff 1988). To control these factors, tools have been developed and utilised to control people and influence organisational cultures.

In just-in-time manufacturing and total quality control production regimes, the plant layout provides management with visibility onto workers' activities, creating and necessitating cultures and systems of surveillance supported by human resource management practices (Sewell and Wilkinson 1993). In this view, a KMS facilitating surveillance can be used to improve workers' performance, suggesting that surveillance is built into the adopting organisation's human resource management policies to this end. These control techniques render workers' activities visible through the KMS, and enable the

enforcement of disciplinary actions should the prescribed norms not be achieved. Knowledge management systems can therefore be used to improve workers' performance by altering their behaviour and thus challenging the espoused values and assumptions impacting on organisational culture (Janz and Prasarnphanich 2003).

Organisational Culture

Organisational culture is essentially about the values, beliefs and norms that form the group culture in a community of work. It comprises artefacts, espoused values and assumptions. Artefacts are the visible elements, processes, structures, goals, climate, dress code and furniture; they are seen, but not necessarily understood, by everyone. Espoused values are shared assumptions of how the organisation should operate. Mismatches between leadership/senior management and other groups lead to serious discomfort and disharmony or even conflict. Assumptions, often tacit, are the views of human nature and values.

The two major problems with organisational culture that make it difficult to change concern reaffirmation and longevity. Culture is reaffirmed and consolidated by rewarding those who conform and, conversely, by rejecting those who do not fit in. It gains longevity and endurance as it is founded on learned responses, the historical bases of which have often been forgotten, and so outdated and false assumptions maybe pervasive. Organisational culture has been identified as both a major obstacle and an empowering factor in knowledge management. Research has focused mainly on cultural barriers to knowledge management and aspects of the cultural environment that nurture it (Chang and Lin 2015; Holste and Fields 2010; Li et al. 2013). However, it is also the case that knowledge management can have a great impact on, rather being influenced by, organisational culture.

One of the biggest influences on both organisational culture and knowledge management is the introduction of KMS, most notably in the form of what have become known as enterprise systems (Hsu and Sabherwal 2012). This chapter outlines how such knowledge management initiatives can be used to capture, integrate, monitor, report and control organisational processes and performance information (Mabert et al. 2003). Increasingly, enterprise systems are the pre-eminent mode for implementation of knowledge management. We demonstrate how people respond to such systems and the impact of knowledge management on organisational culture through the interactions between people and technologies (Al-Mashari et al. 2003; Rai

2011; Suppiah 2011). In exploring this relationship, we suggest that organisational culture is not the only determinant of the success of knowledge management but that knowledge management can affect organisational culture.

Organisational Culture and Knowledge-Sharing

Something that is quite often missing from formalised KMS is the ability to deal with the important facet of knowledge that is tacit. A large part of the group culture of an organisation is in its willingness to share knowledge (Suppiah 2011; Titi Amayah 2013). Without a clear understanding of the underpinning cultural preconditions of knowledge-sharing, organisations will not be ready to accept, adopt and utilise the processes and practices embodied in knowledge management (Fullwood et al. 2013; Gold et al. 2001; Walczak and Zwart 2003). Organisations need to be able to identify, assess and nurture the cultural prerequisites that are necessary for knowledge-sharing to flourish (Davenport et al. 1998; Junnakar and Brown 1997) in order to implement knowledge management effectively. While there has been extensive investigation of the determinants of successful knowledge management implementation, less work has been undertaken to understand the cultural antecedents and implications of management use, and worker perceptions of knowledge management for a positive organisational culture which nurtures knowledge-sharing (Massey et al. 2002). In the same frame, to understand the relationship between knowledge management and organisational culture, models and instruments are needed to evaluate and implement an organisation's capability to operationalise practices that engender knowledge-sharing (Kim et al. 2003). Being able to create the organisational cultural conditions that facilitate the generation, sharing and application of knowledge is key to the success of knowledge management (Collison and Parcell 2001; DeLong and Fahey 2000; Orlikowski 1993). However, defining this set of appropriate organisational conditions is complicated by the fact that implementation of knowledge management is context dependent (Kim et al. 2012; Nordin et al. 2009) and, indeed, it has been suggested that many attempts to develop a suitable organisational culture for knowledge management are doomed before they begin (Gold et al. 2001) because of a lack of understanding of the cultural conditions that are necessary for effective knowledge-sharing. Early work towards understanding the development of organisational culture for effective knowledge management through knowledge-sharing (Holsapple and Joshi 2000; Holt et al. 2004; Massey et al. 2002; Singh et al. 2003), along with an alternative approach based on the Theory of Reasoned Action (Fishbein and

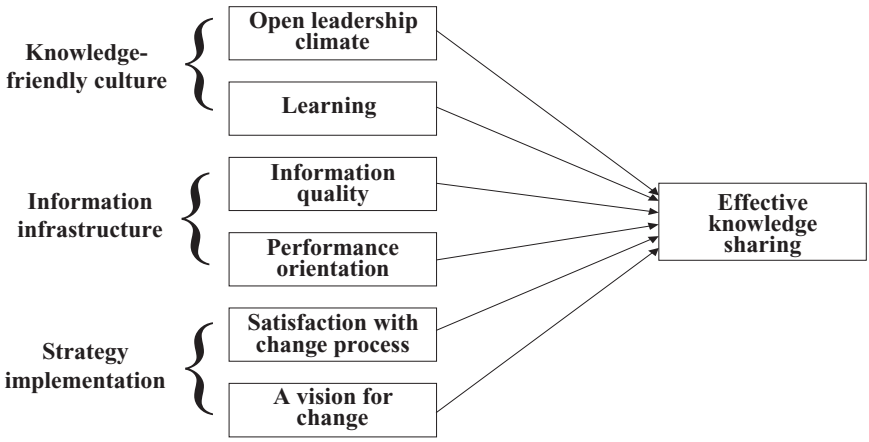

Fig. 6.1 Cultural preconditions for effective knowledge-sharing

Ajzen 1975), examines the determinants of individual knowledge-sharing behaviour and consolidates it into a framework of organisational culture that facilitates knowledge management. It acknowledges the incorporation of organisational culture and social conditions that influence knowledge-sharing attitudes and behaviours (Taylor 2003; Taylor and Wright 2004). This willingness has been shown to depend on leadership climate, organisational learning, information quality, performance orientation, the acceptability of the change process and change readiness (Taylor and Wright 2004; Wright and Taylor 2003; Wright 2007). The elements of an organisation that lead to a culture of knowledge-sharing are presented in Fig. 6.1 (Wright 2007).

Technology and Culture

The social shaping of technology provides a theoretical framework to understand the interaction between the cultural and technological dimensions of the KMS and the impact that they had on Authority Alpha. This emerged from critique of technological determinism and opposes it by arguing that technology does not develop because of an innate human technical logic; rather, it does so because of conscious and unconscious choices made by a person or people about technology that shape the direction of its conceptualisation, invention, design, development, implementation and utilisation. It is argued that technology does not determine human nature but that human actions and interactions shape how technology is conceptualised, invented, designed, developed, implemented and utilised (Bijker 1987; Pinch and Bijker 1987; Williams and Edge 1996). There are numerous social elements

(cultural, economic, organisational and political) that influence the content of technology and its implications for society. When the choices that people make are considered in the context of these different social factors, possible routes emerge that lead to different potential outcomes. These different outcomes could in turn have different implications for society, particular social groups or an organisation's cultural context. Mackay and Gillespie (1992) claim that the appropriation of technology does not imply that people are malleable beings that subject themselves to deterministic forces of technology; rather, they are active, creative and expressive beings that can reject technologies, redefine their purpose and customise or attribute symbolic meanings to them. In some instances, however, designers can develop closed technologies, preventing them from being used in unintended ways.

The influence of the KMS is best understood through appreciation of the adopting organisation's cultural and technological context prior to and during its implementation. This allows us to identify the changes resulting from the KMS and whether it was the technology, the cultural context or a combination of both that changed organisational behaviour. In our case study of Authority Alpha, prior to the introduction of the KMS, the information systems allowed for the processing of transactions but could not generate workforce intelligence. Monitoring of the workforce depended largely on the management styles in each department and did not utilise information technology. Managers did not gather workforce intelligence because the organisation was not target driven: Disciplinary measures were a last resort, the performance management of targets and deadlines was not a priority, and surveillance of the workforce was considered unnecessary. These artefacts espoused values and assumptions that were the foundations of the organisational culture prior to the introduction of the KMS. When Authority Alpha's strategy changed to focus on efficiency, the organisation responded by setting four objectives for an improved information system: improved financial visibility and control; flexible, accurate management reporting; support in delivery strategy; and integrated, transparent process that better supports public needs.

Knowledge Management Systems and Performance Management

Knowledge management has been highlighted as important in the provision of reliable information for performance management (Massingham and Massingham 2014; Taticchi et al. 2010; Taylor and Wright 2006; Titi Amayah

2013). This has been noted as especially important when an organisation is developing a culture that embraces international collaboration (Ringel-Bickelmaier and Ringel 2010). Authority Alpha had been unable to generate workforce intelligence, but this changed in 2004 with the introduction of the KMS. The KMS utilised individual usernames and passwords to log all account entries and thus facilitated direct and continuous visibility of each worker's performance, supporting managers in making workforce-related decisions. The KMS not only improved Authority Alpha's efficiencies but also supported the introduction of targets and deadlines concerned with improving workers' performance. Whenever a front-office worker made an entry into the system it recorded their identity, time of entry and any notes regarding individual enquiries. This provided a record for managers to make real-time observations of workers. With the introduction of the KMS, front-office workers were given targets and deadlines pertaining to how many enquiries they should deal with each day and how long it should take them to deal with different types of enquiry. They were allowed nine minutes to deal with a local taxation enquiry, four minutes for a pest control enquiry and ten minutes for a tourism enquiry. Back-office workers were given targets and deadlines pertaining to how many transactions they should deal with and whether these transactions conformed to the expected standards. Managers observed data about all workers' activities, regardless of whether they were under suspicion of failing to achieve their targets and deadlines; in doing so, they aimed to improve performance by ensuring that all workers knew that they were subjected to surveillance. This knowledge meant that workers assumed responsibility for the constraints of power (Foucault 1977), thus allowing managers to observe workers' aptitudes and determine how long it took them to complete specified tasks.

Workforce Intelligence

Several studies have found that information technologies that automatically generate workforce intelligence can render scenarios of observation and control (Bain and Taylor 2000; Kayas et al. 2008; Ngai et al. 2008; Zuboff 1988). The decision by management in Authority Alpha to introduce KMS therefore changed the technological infrastructure, as its previous information technologies were unable to generate workforce intelligence. The system now had a feature that automatically generated workforce intelligence. It was an artefact socially constructed by those people that developed the technology. They could have designed the system so that it would not automatically generate

workforce intelligence or they could have specified it as an optional function. This indicates that it was the designers' conscious and unconscious choices and actions that shaped the development of the technology underpinning the KMS so that it would automatically act as a surveillance mechanism.

It could be argued that the technology determined that workforce intelligence would be generated, as the authority did not have a choice to enact this function. However, the KMS was introduced precisely because it automatically generated workforce intelligence. This claim is supported by the authority's information objectives, which highlight management's desire to improve performance through the visibility of information-generating capabilities. This suggests that it was the cultural context of Authority Alpha that influenced the decision to implement a KMS because it was understood that it would be used to render workforce surveillance. Moreover, the KMS was configured to specify appropriate lengths of response to categories of enquiries. This configuration was a management decision, as they had to consciously specify how long to allocate for each type of enquiry. Thus, this was an optional function used to generate workforce intelligence. The information system objectives indicate that management decided, before the KMS was purchased, that it would be used as a mechanism to generate workforce intelligence. Its utilisation was therefore appropriated by Authority Alpha's cultural context (Mackay and Gillespie 1992): it was management choices and actions that shaped the outcome of the KMS so it would be used as a surveillance mechanism. If management decided not to use it as a surveillance mechanism, it would have altered the trajectory of the KMS to yield a different outcome (Williams and Edge 1996).

Observation, Targets and Deadlines

Managers in Authority Alpha used two methods to observe workforce intelligence. First, they used a function built into the KMS, which produced a management report detailing who made each entry, when it was made, if there were errors, what type of enquiry it was, how long it took to complete the entry and how many entries were completed within a specified period. Second, management used a drill-down function built into the KMS, which accessed the same information as the management report.

The management report and drill-down were both features integral to the KMS. This means that it was the designers' choice to provide any adopting organisation with the ability to observe workforce intelligence. From a deterministic perspective, it could be argued that management's use of these observational functions was influenced by the KMS itself, as they was not a concern prior to its

operationalisation. However, management indicated in the information system's objectives that they wanted to observe workers so as to improve performance. Though, prior to the system, there had been no surveillance, it was clearly a strategic objective. Management's plan to observe workers' performance manifested when the system's technological infrastructure became operational. Therefore, it was the decisions and actions taken by management that resulted in workplace surveillance. Management did not have to observe the intelligence once it was generated, but they decided that it would support them achieving their knowledge management objectives. This reinforces the view of the social shaping of technology concept, as it was management's choice to observe the intelligence and it was not driven by the technology itself (Williams and Edge 1996).

The analysis of the interaction between the KMS and cultural context of the authority suggests that they were both needed to render workforce observations. Though the KMS automatically generated workforce intelligence, it was management's decision to use it. This indicates that it was the cultural context that appropriated the KMS to facilitate observation. It could be that it was the KMS that determined that workforce intelligence would be used to implement targets and control. However, this was not the case in Authority Alpha, as management stated in their information system objectives that they wanted to utilise a technological infrastructure-generated observable workforce intelligence.

The Cultural Impact of a Knowledge Management System

Perhaps the biggest change in Authority Alpha that was made possible through the technological infrastructure of the KMS was its ability continuously to generate workforce intelligence and identify those not conforming to targets and deadlines. Thus, the KMS transcended the physical arrangement of space and time by generating and storing workforce intelligence about workers located at any point within the authority. It recorded and displayed performance information to yield universal transparency. This networked arrangement created a spatial and temporal surveillance system that analysed performance information in real time (Marx 1985).

When a worker received an enquiry, they often found themselves clock-watching to make sure they did not exceed the deadline for call times. The time spent on each call became the key parameter that influenced workers, rather the effectiveness of providing information or solving problems.

If workers did not achieve their targets, management controlled their behaviour through disciplinary punishments in an attempt to increase their

output. The punishments came in three forms. First, an increase in the frequency of performance reviews, so managers could stress the importance of achieving the targets. Second, workers were sent on training courses to help them improve. Third, workers were made redundant. The performance reviews, training courses and the threat of redundancy were a means to apply corrective punishments to control workers' behaviour. Workers were aware that if they did not achieve their targets, they would face these punishments.

Our case study investigated the use of a KMS as a surveillance mechanism in a public authority and it has extended the debate in the organisational literature about how KMS support the rendering of surveillance.

By analysing the changes that occurred as a result of the implementation of a KMS, the case study enabled an understanding of how surveillance was rendered. It suggests that the information system objectives and the strategic implementation of the KMS facilitated this surveillance to facilitate a transparent control system. The control system used workforce intelligence generated by the KMS, which was then compared with performance targets to determine whether they were achieved. The control system, therefore, provided managers with the ability to monitor workers' performance and, furthermore, hold them accountable should they fail to achieve their targets. Though previous research has investigated the role of technology and surveillance in control systems, our study went further in considering how targets were used in conjunction with the KMS and performance targets.

Previous research indicates that there is an interaction that occurs between the adoption of an organisation's knowledge management strategy and the cultural context in which the associated surveillance takes place. There is, however, a lack of understanding about the interaction of the KMS and the adopting organisation's social context. Our analysis of the interaction between the authority's KMS and the cultural context implies that a combination and interaction of both was needed to influence the rendering of surveillance. Though the KMS automatically generated workforce intelligence, it was management's decision to determine how it was used: the choices and actions taken by management during the purchasing, implementation and utilisation of the KMS significantly influenced the outcome on performance management.

Knowledge Management and the Enactment of Power

There is an argument that power is most effective in changing behaviour to conform if it is both visible and unverifiable (Foucault 1977). In the case of Authority Alpha's KMS, the power was visible as workers could see their performance

information on their computer or other device. The power was also unverifiable because workers knew intelligence about their performance was continuously generated, but they did not know when it was inspected: managers did not continuously observe intelligence even though it was continuously generated. Because workers did not know when they were observed, they assumed they were constantly watched. Therefore, this set-up affected their behaviour as it heightened their awareness of their targets and deadlines.

The KMS undoubtedly altered worker behaviour as this sort of self-regulation did not occur prior to its operationalisation. It had created the automatic functioning of power described by Foucault (1977) as workers had inscribed in themselves a power relationship which saw them become the principle of their own Subjection.

Knowledge Management Systems as Control

Using a Foucauldian lens of power, Sia et al. (2002) explore the use of an enterprise resource planning system as an ambivalent technology of power, to understand whether it can be used as a mechanism to empower or control people within an organisation. They found that control emerged because of the information system, indicating that the technology had a deterministic impact on their case organisation. Furthermore, despite additional organisational control being unnecessary prior to its implementation, the controlling features of the information system were leveraged, while its empowering features were suppressed. By drawing on structuration theory, the authors suggest that this was because the organisation chose to appropriate aspects of the technology which suited its existing arrangements. Their research concludes that the social context in which the information system is embedded leads to self-regulation. Though Sia et al. describe the nature of the organisation's social context before and after implementation as one of institutional conservatism, their research does not elaborate the interaction between the information system and the adopting organisation's cultural context, or how it influenced the rendering of self-regulation.

Elmes et al. (2005) also adopted a Foucauldian lens to investigate changes in organisational control that emerged after the implementation of an information system, identifying two contradictory theoretical concepts. First, empowerment, which refers to the information visibility provided by the

information system's database. It empowers workers to be more efficient and effective but also makes them more visible to those exercising control. Second, reflective conformity, which describes the increased discipline achieved because of the information system's embedded rules and procedures for organisational processes, while also requiring workers to be reflective in order to achieve any benefits from the information system. Though Elmes et al. acknowledge that the introduction of the new information system fostered a disciplinary culture which encouraged workers to follow and value the technology's processes, they do not elaborate on the interaction between the organisation's information system and the cultural context, or the influence that they had on self-regulation.

Sia et al. (2002) and Elmes et al. (2005) suggest that information systems can support the rendering of increased organisational control. Conversely, Dechow and Mouritsen (2005) argue whether information systems can support the visibility of power. They suggest two reasons for this. First, integration supported by information systems may yield more accurate and available information but does not necessarily render workforce visibility because it does not have a place to store details about all management control problems. Second, information systems may result in less integration and, subsequently, less accurate and available information, which means that workforce visibility and, invariably, the visibility of power is reduced.

The interaction between the KMS and Authority Alpha's social context is representative of a contemporary knowledge management debate. It is suggested that KMS can facilitate surveillance and provide control systems, so that the behaviour desired by management results from interaction with the system itself, rather than from a collective desire and internalisation of the performance criteria and targets. Kayas et al. (2008) explored the issue of how KMS, in the form of an enterprise resource management system, can support the application of power. They draw on technological determinism and the social shaping of technology to understand how an organisation's information systems and cultural context interact. Their analysis of the empirical data suggests that the information system provided the organisation with a technological infrastructure from which power could be deployed, thus impacting an organisational culture, as it generates workforce intelligence. However, in this instance, management used the information system to overtly access workforce intelligence, which diminished its power. This occurred because the organisation's cultural context prior to the implementation of the information system did not emphasise workforce surveillance. This cultural characteristic

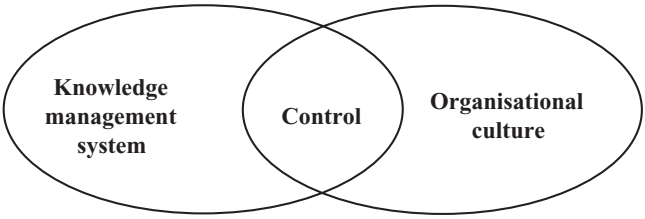

Fig. 6.2 Knowledge management and organisational culture: the creation of control

was embedded in the case organisation's cultural context, which then influenced management's decision not to deploy covert surveillance. Kayas et al. conclude that the information system was shaped and influenced by the sociocultural context of the organisation, rather than the information system determining its social context. Figure 6.2 illustrates how a knowledge management system that supported the generation of workforce intelligence was needed, in addition to a cultural context that emphasised surveillance in order to render control.

Knowledge Management and Organisational Culture: Some Final Thoughts

Most research has investigated the aspects of organisational culture and climate that are necessary to implement a KMS (Janz and Prasarnphanich 2003). There is, however, much evidence that the converse can be true—that KMS can in fact have a significant impact on culture (Ismail and Alawi 2007; Park 2004).

Technology has impacted on workforce surveillance and it has been argued that there is a dynamic relationship between surveillance technologies and social control (Kim 2004). The data storage capability of technology has enabled increased volumes of information to be captured and so has altered the nature of surveillance (Marx 1985). Technology has extended organisational memories across time and space because their networked functionality enables data to be stored to provide management with the ability to analyse transactions and events that have taken place, are taking place or may take place. Zuboff (1988) investigates the surveillance power of information technology in the workplace, finding that information systems that record, translate and display human behaviour provide the computerised version of universal transparency. These systems, which do not depend

on the physical arrangement of buildings, record-keeping or the presence of an observer, can become information panopticons: information systems capable of automatically and continuously recording data required for analysis.

Culture has many similarities to attitudes. Like attitudes, culture is enduring: Once established it is difficult to change; it is easier to influence a new culture of attitude than it is to change one that has become ingrained. There is some debate concerning the relationship between attitudes/culture and behaviour. It is tempting to think that changing attitudes will lead to behavioural changes, that in turn will persuade people that the new way is more attractive than enforcing change. Alternatively, it is quicker to enforce changed behaviour and if this becomes embedded in routines (artefacts), it quickly influences attitudes and cultures. Consider social interventions such as those surrounding wearing protective headgear on motorbikes, using seat belts in cars, drink-driving, smoking in public places and using mobile phones while driving. These have all been the subject of 'short sharp shock' interventions in the form of legislation which serves to enforce new behaviours and impose sanctions on those who do not conform. Though few would now argue with the public benefit of such behaviours, each of these situations was initially resisted with arguments that went as far as claiming the infringement of human rights. So, in these cases, attitudes quickly followed new, if enforced, behaviours. This is true also of the cultural changes that arise from new routines and behaviours engendered by KMS. Indeed, there is evidence of positive levels of job satisfaction and organisational/job commitment of those who work in (even the most restrictive) knowledge management surveillance regimes (Rose and Wright 2005).

From our consideration of knowledge management and organisational culture, we propose ten key considerations for management teams seeking to implement and leverage KMS (Fig. 6.3).

In conclusion, KMS are often, at their best, welcomed by management as a way of leveraging information to improve performance through a better understanding of the organisation's efficiency. Such systems may highlight that costly changes or investments in plant and physical infrastructure would be beneficial, but this may lead to downtime and capital expenditure impacting on the balance sheet. So, alternatively, and at worst, knowledge management can be seen as a way to monitor and control the workforce through data-driven sanctions and rewards that are more concerned with a one-straightjacket-fits-all approach to efficiency rather that effectiveness.

1.	Knowledge management can have unanticipated consequences for organisational culture
2.	An organisation must include consideration of the important elements of knowledge sharing within its knowledge management strategy
3.	The antecedents to effective knowledge sharing should be carefully planned in any knowledge management initiative
4.	The cultural impact of the surveillance rendered as an outcome of implementing a knowledge management system should not be underestimated
5.	The sociotechnical relationship should be considered when management implant knowledge management systems
6.	Managers need to understand and account for the impact on power relationships of the implementation of a knowledge management system
7.	The artefacts, espoused values, and assumptions should be integrated into any cultural change associated with knowledge management
8.	Rewards and sanctions aligned to knowledge management should be considered to attain desired cultural change
9.	Performance management outcomes need to be balanced with the impact of knowledge management systems on organisational culture
10.	Behavioural and attitudinal responses to knowledge management systems should be monitored throughout the implementation of a knowledge management system

Fig. 6.3 Ten considerations for a knowledge management system

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7

Knowledge Management from a Social Perspective: The Contribution of Practice-Based Studies

Silvia Gherardi and Francesco Miele

Introduction

A social perspective on knowledge, knowing and the management of knowledge has often been constructed in opposition to the concept of knowledge as a resource, separate skill or commodity that characterizes the literature on information society, the economics of knowledge and a resource-based view of the firm. While we are not denying that the desire to express an alternative view has been driven by open conflict with an epistemology of knowledge as its object, or that the process of differentiation has sometimes assumed harsh tones, dualistic thought nevertheless induces us to look for differences that help neither to develop a more complex view nor to construct complementarities around differing representations of the phenomenon under study. In an introduction to a special virtual issue of the journal *Human Relations* devoted to 'Knowledge and Knowing in the Study of Organization', Tim Kuhn (2017) reminds us that, at the outset, in the works by Brown and Duguid (1991) and Cook and Brown (1999), there was no oppositional view

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S. Gherardi (✉) • F. Miele
University of Trento, Trento, Italy

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of knowing versus knowledge. At the same time, Kuhn underlines that empirical work that transcends opposition has been rare.

In fact, following Kuhn's observations, we believe that the current challenge in organization studies is how to formulate what is specific about knowledge as a resource and how to approach knowing as a collective and organizational activity. The various forms of practice theory tackle this challenge by developing a practice epistemology and methodology grounded on specific situated practices and the texture or nexus of practices (Hui et al. 2016; Russo-Spena et al. 2017) that surround them. In order to cope with this challenge more effectively, it is helpful to have an detailed understanding of what is at stake when scholars adhere to a social perspective on knowledge and knowing.

In this chapter, we illustrate a social perspective through its internal articulations and differences. We argue that a 'social perspective' does not exist as a single coherent model; rather, it is a becoming-perspective that continuously acquires complexity as it is developed over time. We suggest that certain features of a social perspective remain stable, such as the concept of knowledge formulated by Blackler (1995)—as mediated, situated, provisional, pragmatic and contested—and as a conception of knowing grounded in what Mol (2008: 152) calls a philosophical shift 'in which knowledge is no longer treated primarily as referential, as a set of statements *about* reality, but as a practice that interferes with other practices'. Other features and nuances of these same features appear as the travel of ideas is put into motion, starting from the formulation of the image of a community of practice, in which knowledge is embedded in social relations, to the development of a practice epistemology in which knowledgeability is enacted by sociomaterial relations. The chapter first provides a sketch of this travel of ideas and then focuses on three organizational processes relating to managing knowledge (sharing knowledge between experts and novices, embedding knowledge in material practices, and innovating as an ongoing process). These three processes enable us to discuss three relationships that have been established between knowing and practising (containment, mutual constitution and equivalence) that articulate different nuances within a social perspective of knowledge and knowing.

Communities of Practice and Knowledge Management: A Brief History of the Travel of Ideas

We now briefly outline the travel of the idea of knowledge as a situated activity in order to illustrate the origins of the concept of knowledge management in the literature, starting from a social learning theory and ending with the epistemology of practice.

The stages of this travel can be summarized as follows. The original idea of community of practice (CoP), which was born within a predominantly anthropological literature, underlined the social and situated dimension of learning. When it was translated into management studies, the emphasis shifted to the problem of identifying and managing or cultivating the community dimension. Its subsequent adoption in the context of online communities stressed the social skills required to compensate for the interactive dimension missing from technology. Finally, the move from a community of practice to the practices of a community accounts for a stronger link with a social perspective of knowledge management as a collective and widespread process of knowing while working and innovating.

If we were to attempt to illustrate and provide examples of the trajectory of the concept of community of practice in relation to the evolving idea of knowledge management within it, we would need to devote this entire chapter to the endeavour. We have, therefore, chosen merely to refer to previously published works that well document the origins and development of the debate (Contu and Willmott 2003; Fox 2000; Gherardi 2009; Swan et al. 2002), and to conduct a brief excursus that will enable us to introduce the main contributions that we wish to develop in detail later.

It is customary to date the origin of the term CoP to Lave and Wenger's book *Situated Learning*, subtitled *Legitimate Peripheral Participation* (1991). The idea is certainly contained in the book but it is not given the salience that it subsequently acquired. The term initially served to furnish a concise version of a complex theory that sought to shift the debate from cognitive theories of learning to social theories. This social theory of learning draws attention to the ways in which situated processes of learning contribute to knowledge acquisition in social settings.

The great success enjoyed by the term CoP at the time of its appearance was due to the metaphor on which it rested, which was that the community should replace the individual as the learning subject and the repository of knowledge as a collective heritage. The collective subject thus became the source of agency, and knowledge was not necessarily confined to the mental mechanisms of an individual. Instead, the term 'knowledge' as a noun shifted to the verb 'knowing', a collective activity. Informal learning is more closely associated with the anthropological and ethnographic literature on CoPs, since it is believed to offer a more effective approach to knowledge management as a social and collective activity by emphasizing on-the-job learning as a form of participation that occurs experientially, in culturally embedded ways, situated in communities of practice within work-based organizations.

The authors were concerned with the process whereby novices become full practitioners through participation—as a way of belonging—in a community

of practices. Their social theory of learning sought to extend the notion of learning outside schooling and traditional places. In fact, Brown and Duguid's (1991) understanding of CoP also stresses the 'non-canonical' nature of learning. As Fox (2006: 428) has noted, learning is a reciprocal relationship between persons and practices, because as learners move towards full participation—the practice itself is in motion. This brief discussion of the origins of CoP enables us to contextualize the concept within a vision of situated learning, and to anticipate how the concept of situatedness progressively acquires a twofold meaning of situated-in-social-situations and situated-in-materiality—that is, in the instruments, technologies and bodies that mediate with the external world. We will illustrate how knowledge is embedded in social relations, and how it is embedded in materiality.

When the term CoP was transferred to management literature, a fierce debate began around the issue of whether or not a certain set of workers could be defined as a community of practice, assuming that the term CoP designates an entity endowed with 'real' existence. Wenger (1998) wrote that a CoP is not a stable or static entity, that it evolves over time, that its existence may not be evident to its members, and that it should not be reified. He also maintained that management cannot establish a CoP but can only facilitate its spontaneous emergence. Accordingly, organizations should sponsor the creation of certain loose organizational structures around which it is hoped that communities of practice may then interact. Nevertheless, such communities do not only have structural parameters; they also have epistemic parameters, as Thompson (2005: 151) argues, 'where participants' willingness to express their ideas as conceptual boundary objects around which others may engage and develop ideas is a minimum requirement, but where too much inward communicative focus is likely to result in gradual loss of meaning, with a negative effect on the community'.

Nevertheless, the analytical framework that was later developed for managerial purposes was built on a conception of CoP as a mechanism through which knowledge is held, transferred and created (Wenger and Snyder 2000; Wenger et al. 2002), while at the same time, more attention is devoted to architectures of knowledge. For example, Amin and Cohendet (2004) drew an important distinction between knowledge that is 'possessed' by the firm—in the form of established competencies of stored memory—and knowledge that is generally 'practised' within CoPs. There is a tension between possessed and practised knowledge and between the hierarchically defined architecture of specialized units of possessed knowledge and the distributed, and always unstable, architecture of knowledge that draws on a continuously changing capacity for interpretation among actors. This tension is also pervasive in the

sense that 'knowledge management' is understood as an activity at the organizational/structural/managerial level or at the interactional/social/situated level of ongoing everyday life.

The view of managing knowledge as an activity internal to a CoP has been taken up by the literature on virtual or online communities, which has enthusiastically appropriated the concept in many of its areas of interest—such as distance working, coordination through information and communications technology (ICT), sense-making as social creation in virtual encounters, and many of the other themes common in CoP literature. In fact, this distinction between online and offline communities is less relevant today (Ardichvili et al. 2003; Huysman and Wulf 2005), since forms of participation are more crucial (Dubé et al. 2005; Wasko and Faraj 2000). The comparison between exclusively virtual and offline communities can be better understood if we locate both of them on a continuum, and then do the same with the idea of sociality. In this regard, the literature review carried out by Amin and Roberts (2008) is careful to distinguish between communities whose purpose is the development of learning and the exchange of knowledge, on the one hand, and those in which learning simply 'happens', on the other. When knowledge management becomes the purpose of the community, virtual CoPs are similar to epistemic communities, and share leadership and management problems with them. Classic examples of this are the communities that have formed around open-source systems (Hakken 2003) or communities of software developers (Faraj and Sproull 2000), or the self-help communities that use the internet to communicate on a topic of common interest (Josefsson 2005). Research in this area is at its most innovative when it discards the concept of CoP as an entity in itself, and with it the problem of how to turn a group into a community, and returns to the initial view of learning as a situated activity (Newell et al. 2002). For example, a study of online communities (Faraj et al. 2011) has offered insights fruitful for theorizing on more general cases of knowledge collaboration in organizations. In an online community, knowledge collaboration involves individual acts of offering knowledge to others, as well as adding to, recombining, modifying and integrating knowledge that others have contributed. Here, knowledge collaboration is broadly defined as the sharing, transfer, accumulation, transformation and co-creation of knowledge; and this literature contributes to our understanding of how the multiple contributions of various people unfold over time.

In this regard, the study of the spontaneous (and often self-managed) communities that Preece (1999) calls 'empathic communities'—like the medical support group that she studied—focuses on the practices mediated by ICT technologies that perform empathy by providing emotional as well as informational

support. So, this study contributes to the literature on CoP by showing that instrumentality is not enough to hold a CoP together. This type of analysis also furnishes better understanding of the many failures of technological systems for knowledge management (McDermott 1999; Newell et al. 2006), which are unable on their own to produce the sociotechnical environment that makes them work.

A certain unease with the term CoP appeared together with critiques and proposals to go beyond it. We just mention as alternative formulations the 'community of knowing' (Boland and Tenkasi 1995), a distinction between 'knowledge communities and knowledge collectivities' (Lindkvist 2005), 'the art of knowing' as opposed to the science of knowing (Duguid 2005), and 'knowledge-sharing communities' (Swan et al. 2016) that operate alongside project team and functional structures and are designed to improve organizational performance by enabling the sharing of knowledge across functional and geographical boundaries. The concept of CoP has been much debated and harshly criticized, and the main reason adduced for abandoning the concept is that, while travelling, it has become the symbol of a 'new type' of governance of corporate knowledge—management-by-communities (Amin and Roberts 2008), and especially management-of-communities. These criticisms have been well documented (Handley et al. 2006; Roberts 2006), and the idea that the emphasis on the terms 'community' and 'practice' should be reversed has been present in the literature for some time (Brown and Duguid 2001; Gherardi et al. 1998; Roberts 2006; Swan et al. 2002). It has recently given rise to a broader debate that has rediscovered the heuristic value of practice within organizational studies and envisages a 'practice turn' in the social sciences (Gherardi 2012; Nicolini 2012; Schatzki et al. 2001). The final translation of the concept of CoP has taken place in the literature under the label 'practice-based studies', in which different strands of analysis share a predominant interest in situated activity and the role of technologies and artefacts in mediating the relationship with knowledge and the world. Once the reversal of the concept of community of practice into practices of a community has been accomplished, a number of changes in research interests come about.

This reversal is more than just a play on words, and shifts our attention to how practical knowledge is enabled in situated contexts of action. The expression 'epistemology of practice' as opposed to an epistemology of knowledge possession (Cook and Brown 1999; Tsoukas and Vladimirou 2001) summarizes the first contribution that CoP makes to a social perspective on knowledge management. As Hislop (2003: 165) writes: 'The communities of practice concept is based on two central premises: the activity based nature of knowledge/knowing, and the group based character of organisational activity'.

If we follow this line of argument, we take a practice epistemology and define practice neither as a simple 'doing' nor as a bundle of 'sayings' and 'doings' but rather as a collective knowledgeable doing, thus stressing 'knowledgeability' as the central practice phenomenon.

A practice epistemology to knowledge management is therefore grounded in a conception of knowledge as a situated activity (knowing-in-practice) and in a conception of management as collective, diffuse and processual managing. From this epistemology, we explore the three main themes that we consider to be the building blocks of a social perspective on managing knowledge as an organizational process. We illustrate three processes that are inherent in managing knowledge: (1) sharing knowledge between experts and novices; (2) embedding knowledge in materiality; and (3) innovating as an ongoing process.

Sharing Knowledge Between Experts and Novices

Following the situated learning paths that involve novices has been useful for the purposes of addressing dynamics of knowledge-sharing within organizational contexts since the emergence of the concept of communities of practice.

The study of this topic has often revolved around the concept of legitimate peripheral participation, which encourages focus on the regime that allows novices to participate actively and legitimately in the performance of tasks while only contributing to certain limited aspects of the final product. The result of this analytical construct is that the acquisition of notions and theories that takes place in formal contexts (for example, training courses for apprentices or courses to update the skills of expert workers), which was central to traditional cognitive theory, is moved into the background. Attention then shifts to the processes of participation, belonging, commitment and inclusion that arise in a certain community of practices. When seen from this viewpoint, learning is the result of participatory processes in which novices learn through interaction with others, and, in particular, through the reproduction of practices with more expert actors. The intermingling of learning and participation dynamics has been the focus of a good number of studies that since the 1990s have considered very different subjects and forms of apprenticeship: tailors belonging to the Vai and Gola ethnic groups in Liberia (Lave and Wenger 1991); building workers and the transmission of knowledge on workplace safety (Gherardi and Nicolini 2002); university students in faculty student councils (Eberle et al. 2014); doctoral students beginning

their academic careers (Hasrati 2005; Teeuwsen et al. 2014); and participants in online vocational training projects for adults (Gray 2004) and projects to involve citizens in the formulation of certain scientific discoveries (Mugar et al. 2014).

One particularly important example of the situated interpretation of processes of sharing knowledge is provided by the study carried out by Karen Handley and colleagues (Handley et al. 2006). Starting from an empirical study of consultants to large companies, the authors describe in minute detail the initially peripheral participation of junior management consultants in certain consultancy projects for large companies. The focus in this article is on the multiple forms of participation of novices in consultancy practices—for example, performing back-office activities in which the novices analyse and interpret the data provided by the clients under the supervision of the senior managers; attending meetings of minor importance without taking part in them, thereby gaining the opportunity to observe the interactions between expert consultants and clients from close up; and running small meetings and taking responsibility for certain client deliverables, thereby beginning to conduct themselves as 'good consultants'. The learning of consultancy practices therefore occurs gradually, starting with passive assistance with the work carried out by more expert colleagues, and ending with reproduction of what they have previously observed after a period of doing minor tasks not visible to the clients. It is only at the end of a long learning process that the novices begin to feel that they are fully part of a professional community, and gradually move away from its periphery. Knowledge sharing between novices and experts thus appears to take place mainly through continuous interaction with the experts, where the so-called tacit knowledge referred to by Polanyi (1958) plays a fundamental role. The terms 'tacit knowledge' and 'sensible knowledge' (Strati 2003, 2007) denote those types of knowledge that it is difficult to explain in words, and which are learned through the body, imitation and, more generally, forms of knowledge-sharing that are not acquired through cognition but only by means of interpersonal relationships and sensible knowledge. The practices of a community, the culture of a practice and the bodies of those who take part in the practice anchor and transmit a form of know-how that is learned through participation.

The concept of legitimate peripheral participation led to a focus not only on learning in productive work but also on the maintenance and reproduction of everyday sociability. This learning, which is often tacit, is effectively illustrated by the study by Bruni and Gherardi (2001), which focused on the apprenticeship of a young woman in an international consultancy firm. The protagonist was in a work environment in which the consultants were predominantly

male, and in which, therefore, the modalities of acting and forming relationships had a dual connection with the reproduction of masculinity. The young woman was on the periphery of certain community practices not only because she was a neophyte but also because she was a woman, and so at risk of being relegated to merely executive and secretarial tasks. Through the use of an ethnographic methodology, the authors showed how the protagonist became a 'good consultant' not only because she learnt to master a technical lexicon but also because she began to reproduce gestures, clothing and a sense of humour that could easily be classified as male. Although the young woman initially found the artefacts—for example, the suitcase provided by the company—and habits—for example, smoking and making sexually themed jokes—that were widely shared by her colleagues troublesome and ill-suited to her, after a few months she became perfectly able to implement discursive and corporate practices in a way that was judged by her more expert colleagues to be competent because they reproduced the dominant maleness. In this study, therefore, it was shown that while a novice was learning and performing a professional identity, she was also learning what has been called 'gender-switching'—that is, implementing gender performances in which the borders between masculinity and femininity are situationally disobeyed and affirmed. Learning gender performances is only one example of the ways in which power relationships traverse a community, and in which they constitute knowing-in-practice.

Knowledge-sharing between experts and novices also takes place indirectly through the verbal sharing of past experiences. As the works of Orr (1990, 1996) have shown, exchanges of war stories—that is, stories about the most problematic work experiences—within a community of practice have the important role of sharing the manner in which the issues that characterize routine work are analysed and the tricks for resolving them rapidly. These narratives also transmit the rules and codes of conduct underlying a certain practice, and show novices what is legitimate and typical for an expert worker. Through these moments, the listener has access to a vast repertoire of practical knowledge and strengthens his or her identity as member of the community, while the person relating the story gains authority and centrality within it. In other cases, these narratives are instead effective means to circulate warnings and teach novices about the types of conduct to be avoided in order to avoid running the risk of sanctions and/or real danger. For example, in an ethnographic study on the transmission of knowledge of safety on a building site, Gherardi and Nicolini (2002) showed how workers shared stories of their direct or indirect experiences in order to teach novices how to identify and avoid firms that had little interest in the safety of their workers. Telling and listening to stories, therefore, is anything but a secondary activity in knowledge-sharing processes,

and makes a decisive contribution to forming a collective memory that stores and transmits what has been learned in the field, and constitutes a normative infrastructure that supports the performance of working practices (Gherardi 2012).

The studies that have been presented thus far are characterized by a view of working practices as containers of knowledge, places in which knowledge is stored, developed, shared and transmitted. Even in cases where sensible knowledge is anchored in the body—and therefore it is the body that knows and learns (including gender performance)—the practices remain the container of a tacit knowledge that has been embodied. This means that there is a relationship of containment between knowledge and practice, and—to paraphrase the metaphor employed by Szulanski (1996)—knowledge in the cases described above is 'sticky' and can only be transmitted to novices through their active involvement in the daily life of the community. Thus, knowledge is anchored within social relations and shared through them. This is different from the way in which we describe it in the following section, where knowledge is also embedded in the materiality of the objects, instruments, technologies and physical environment of the workplace.

Embedding Knowledge in Material Practices

Since the end of the 1990s, a significant number of articles has focused on how knowledge is first embodied and embedded in technological practices and objects of everyday use, including the physical environment in which the practices are performed, which enables individuals, groups and communities located far away from one another to work together. This can be seen in the study by Yakhlef and Essén (2013) on the provision of services for the elderly. In this case, in the course of their care practices, operators use their perceptive senses to give shape to the subject of the practice—the elderly person—by defining his or her state of psychophysical health and the type of care required. Through the use of perceptive senses—for example, by looking at the elderly person's facial expressions in order to understand his or her mood, or by using smell to determine the state of upkeep of his or her home—needs are redefined and the care practices to be undertaken are recalibrated.

Over the years, especially in studies on information systems, various ways to conceptualize the relationship between sociality and materiality have emerged (Cecez-Kecmanovic et al. 2014) as a sociomaterial practice.

First, the study of knowledge management as an internal process within the community has given way to analysis of how a number of different communities

manage knowledge across borders, and the role of materiality in the management of knowledge within various organizational contexts characterized by different professional groups separated by pre-existing boundaries that potentially create more or less permeable barriers. This branch of the literature is distinguished by its focus on the use of ICT in working practices. This may, for example, involve the development of new products in the automobile sector and attempts to make connections among various organizational processes, from design engineering to sales work (Carlile 2002, 2004); the use of digital platforms to promote knowledge sharing among various design teams (Newell et al. 2006) or in outright inter-organizational networks (Ciborra and Andreu 2001); cooperation dynamics between researchers and doctors in biomedical innovation (Swan et al. 2007); collaboration between computer companies interested in the development of new content management systems (Kimble et al. 2010); and the role played by coordinators of knowledge-sharing communities in stimulating change processes (Swan et al. 2016).

Carlile's contribution (2002, 2004) has been especially important. He suggests a classification of the types of boundaries that may arise in the course of cooperation among different communities, distinguishing between syntactic, semantic and pragmatic boundaries. *Syntactic boundaries* relate to the difference between social communities caused by the use of different grammar, labels, languages and symbols. These borders may be crossed by using objects—which are classified in the literature as 'knowledge repositories' (Carlile 2002: 453)—that permit the actors to develop a common syntax. For example, in the area of research and development projects in the medical field, the creation of a shared database that is comprehensible to doctors and researchers alike lends itself to incorporation of knowledge that is useful for both professional groups and which can be used for both scientific and clinical purposes (Swan et al. 2007). Conversely, *semantic boundaries* refer to differences in accepted interpretations and meanings among actors in the implementation of a shared project. In this case, objects can reveal and accommodate differences in perspective, and therefore reconcile differences in meaning, so helping create a 'common' understanding or objective and 'a concrete means for individuals to specify and learn about their differences and dependencies across a given boundary' (Carlile 2002: 451). This is the case, for example, of questionnaires to collect clinical data that emerge from negotiations between the expertise and interests of doctors and researchers and are adopted in professional practices in both cases. This is because, on the one hand, they are easily administrable to patients for the doctors, and on the other, allow researchers to collect new data that cannot be found in the literature (Swan et al. 2007). Finally, *pragmatic boundaries* emerge from the divergence of the

interests that distinguish different professional groups and communities and frequently lead to a failure to insert new practices and technologies deemed to be dangerous for the balance of power and pre-existing hierarchical structures (Mørk et al. 2010). These boundaries can be more easily crossed by the creation of flowcharts, work plans and draft projects that evidence the interdependence between the professional groups and the shared objectives that they may attain.

Various empirical studies have focused on the practices emerging around objects and technologies in the health care field, with special interest in the ICTs created to monitor the clinical status of chronically ill patients from a distance (Bruni et al. 2007; Nicolini 2007; Piras and Miele 2017). The health care sector has been the site of numerous innovative knowledge management practices, and Nicolini et al. (2008) have conducted a review of the literature on knowledge management concepts, policies and practices within it, documenting a growing interest in social versus ICT-based initiatives for supporting knowledge management processes.

The fragmented and widely dispersed nature of knowing in the health care sector is what makes it distinctive, but the attention paid to the 'nature of knowledge' and its consequences for management may nevertheless be transferred to other similar 'knowing contexts' and enrich the current debate, which tends to oversimplify the differences between knowledge*s*.

One example of how materiality also includes discursive practices and how health knowledge is embedded in language is Gherardi's study (2010), in which a cardiological teleconsultation system was designed to put the general practitioners of cardiopathic patients in contact with a pool of expert cardiologists. The system consists of a service centre to which the general practitioners can send their patients' electrocardiogrammes in case of need, and then be put into contact with one of the cardiologists available at that moment. In this case, we see how the representation of the patient's clinical condition gradually emerges from an intermeshing of the discursive and the material: the telephone call to the call centre; the description of the patient's physical symptoms to the general practitioner; the information contained in the patient's electrocardiogramme; its re-elaboration in medical terms as supplied to the specialist by the general practitioner, together with an explanation of the overall clinical picture; recollection of the rules for accessing A&E, and their potential usefulness for resolving the clinical case under review; negotiation of a final decision on how to proceed; and immediate hospitalization or reassurances from the specialist to the general practitioner, and thereafter to the patient. The knowing of the patient's clinical condition occurs during the course of the reproduction of this texture of practices, which is profoundly

entangled with the communications infrastructure, and leads to a definition of the clinical situation under review and the decision to be taken.

As Piras and Miele have shown (2017), when everyday sociomaterial practices are reproduced, the boundaries, identities and relationships between the social and the material are enacted within situated activities. Considering the case of a digital platform for diabetic patients in a number of hospital departments, the authors reveal how different practices and identities are negotiated when pre-existing cultural backgrounds, professional ethics and habits in the field vary. On some occasions, a practice of control from a distance emerges, in which the doctor assumes a paternalistic role towards the patient and the platform becomes a means whereby the former can supervise the latter; on other occasions an educational relation arises whereby the platform is a valid support for improving the patient's self-management abilities; while on yet other occasions a dual relationship is formed between the platform and the patient, in which the former provides automatic feedback and advice to the patient, replacing the role of the doctor, at least in part.

Knowledge is therefore an activity that renews itself in the course of everyday working practices: on the one hand, various professional groups create and/or use artefacts and technologies, and incorporate different kinds of knowledge and expertise within them; on the other, objects, in part thanks to the knowledge embodied in them, enable various communities to collaborate in an innovative manner. In fact, social practices are constrained and structured by organizational objects and artefacts; at the same time, they contribute towards modifying the material characteristics and using them in ways very different from those imagined by the designers. A relationship of mutual constitution is thus established between knowledge and practice, in which objects and technologies are created while they are being used, and reciprocally, the ways in which they are used give shape to modes of practising. This means that materiality lies outside practices, or, as Leonardi (2011) puts it, practices are imbricated in materiality. This view, termed by Jones (2014) weak sociomateriality, conceives the social and material worlds as separate entities that are, however, mutually interlocked. Thus, in weak sociomateriality, entities exist independently of their enactment in practice, and it is through relations between entities that agency is achieved. Conversely, strong sociomateriality assumes a relational ontology in which entities only exist in relation to other entities.

In recent years, one area of practice-based studies, drawing on science technologies studies and, in particular, actor–network theory (Feldman and Orlikowski 2011; Latour 2005) and the new feminist materialism (Barad 2007), has turned to a strong sociomateriality. This area of the literature has

ceased to distinguish the human from the nonhuman, the social from the material, and the cultural from the natural, and has defined everyday practices as constitutively entangled with materiality (Orlikowski 2007; Orlikowski and Scott 2008). From this perspective, the distinction between knowing-in-practice and innovating while practising is blurred.

Innovating Knowledge as an Ongoing Processes

The aim of strong sociomateriality is to dissolve simultaneously the separation between technology (and other materialities) and the social and episodic treatment of time. A sociomaterial understanding of practice considers that the boundaries and properties of all the practice elements become decisive when they are enacted in material configurations of connections. Therefore, practice becomes 'a situated practice' in its contingent 'practising': that is, within a processual view in which practising constitutes a perpetual state of becoming (Tsoukas and Chia 2002). Changes and innovations in practices are inherent in their becoming, as they are sites where human, nonhuman and more-than-human activities are constantly evolving. Attention shifts from identification of what the elements that form a practice are, considering that the differences within practice theories are not especially important (Guzman 2009), to how all these elements acquire agency by being connected, as expressed by the concept of *agencement* (Gherardi 2016). If we want to think about the implications of such a shift for a social perspective on knowledge and knowing, we might consider the *praxiographies* (that is, the ethnographies of practice) proposed by Mol (2002), the enacted body (Mol and Law 2004) and the work of Law and Lien (2013), in which the authors elucidate how the object of knowledge (be it arteriosclerosis, hypoglycaemia or salmon) comes to attain an empirical ontology if it is formed within specific practices of professional communities and their situated activities. For example, the knowledge object 'salmon' is materially manufactured in situated scientific and fish-farming practices. A slippery empirical ontology of various salmons is enacted within a choreography and a texture of practices that not only generate particular realities but also work to generate otherness. In fact, these practices also enact a penumbra of not quite perfectly realized realities: animals that were almost—but not quite—created. We can therefore understand how the travel of ideas has moved from seeing knowing-in-practice as an activity situated in working, organizing and innovating within a community of practice, to see knowledge as embedded in social relations—to conceptualize it as embedded in sociomaterial relations and to grasp how

knowing is social, material and performative and cannot be separated from practising.

Taking inspiration from a strong sociomaterial approach, equivalence has been established in the relationship between practising and knowing: increasing numbers of contributors have set themselves apart by conceiving innovation as a continuing, incremental, distributed process that cannot be separated from the reproduction of social practices. This effort to display the everyday nature of innovation has concerned various fields of analysis, following technological (Mele and Russo-Spena 2017; Nicolini 2011) or institutional (Gherardi and Perrotta 2011) changes. Innovation takes place in the course of the everyday performance and adjustment of the practice, in a '*répétition sans répétition*' (Clot and Béguin 2004). In suggesting an interpretation of innovation as a continuous process in a texture of practices, a number of authors have looked for new analytical tools for adopting a post-human view of agency. Among the most interesting concepts is undoubtedly *agencement*, a word that is currently used in French as a synonym for 'arrangement' or 'fixing' and has been used by Deleuze and Guattari (1980) as a philosophical term to mean 'in connection with'. In recent years, the concept of *agencement* has been used in the social sciences to study financial markets (Hardie and MacKenzie 2007), and then taken up by practice-based studies to examine deliberate and emergent operations, processes and events that do not necessarily align in terms of goals, functions, timing, identities, roles, processes and power relations. As an example, one can cite the reflections of Fortané and Keck (2015) on biosecurity as an illustration of how *agencement* can be helpful for working practices—and the connections that link them—from a post-human perspective that decentralizes the subject as a single source of agency. Biosecurity, understood as an area that includes policies and techniques for the management of infectious diseases in the animal world, takes shape through an *agencement* between a variety of practices (and elements) that includes: animal surveillance, where animal behaviour is monitored by experts in ethology and veterinary medicine with the dual aim of preventing health crises and protecting species at risk of extinction; human surveillance, which, through the construction of biosecurity norms, controls the organization of society and territories; and industrial and business research practices aimed at developing and testing new agroalimentary products and/or control devices that prevent the propagation of viruses. Practices for managing agricultural production, business practices, academic practices and practices for monitoring human populations or maintaining biodiversity are redefined as biosecurity practices that have the purpose of producing surveillance data. As Fortané and Keck have highlighted, surveillance practices do not only lead to new

forms of knowledge and understanding in relation to animal disease; they also foster the production and/or maintenance of ignorance. In other words, surveillance practices operate on the boundaries of visibility/invisibility. While animal surveillance devices throw light on what are sometimes highly controversial issues (such as the role of wild fauna in the emergence of new diseases), they also fudge certain aspects that are more difficult to document (such as the impact of the circulation of domestic populations within integrated sectors).

Through an *agencement* between new and old practices redefined as biosecurity practices aimed at producing surveillance data, things acquire life and become: that is, alarm signals regarding potential new diseases are noted and defined, the technical tools for preventing them are created and tested, and controls on humans and animals become the new epistemic practice. Through *agencement* processes, a texture of practices emerges that traverses both individual organizations and individual communities of practice, giving rise to continuous innovation in the processes of knowing, in which biosecurity is now globalizing what has already been observed in relation to traceability: the signs that alert us to new diseases would have no meaning if they were not embedded in pre-existing practices. So, biosecurity only exists within the fabric formed by knowledge, techniques and activities that meet other objectives that are often complementary but that can also be contradictory.

In the reconstructed travel of ideas, the influences deriving from other theoretical trends have led one area of practice-based studies to divert attention from communities to processes of practising and knowing, in the sense of activities that cannot be separated one from the other. The establishment of a relationship of equivalence between practising and knowing has led to a focus on the ways in which the elements of one practice are enacted within their relations and in practising, and how knowing is performative of sociomaterial relations. When interpreted in this way, practices emerge from the *agencement* among processes, operations and events, and become contingent—and never fully stabilized—results of the relations among objects, practitioners, infrastructures, institutions and territories. Far from being an activity that is only performed within predefined organizational spheres and time frames, innovation becomes a continuous process that is intrinsic to practising and, in particular, to a continuing redefinition of the ties between practices and the relations between the elements on which these practices rely.

Discussion

The three processes that we have chosen in order to illustrate knowledge management are based on the assumption that a social perspective on knowledge, or what counts for knowledge, does not exist independently of social relations

and social practices. Knowing is thus an activity that is embodied and embedded in, and emerges from, situated practices; therefore, it is a collective achievement.

We can tie these three processes into the trajectory of the travel of ideas that we introduced in the first section of this chapter. The literature on communities of practice can, in fact, be viewed as the starting point for the development of a social perspective on how knowledge is transmitted to novices and how it is acquired in the process of becoming a practitioner and developing an identity as a such. Sharing knowledge and keeping it alive within a community's practices may be considered to be this body of literature's main contribution to knowledge management. At the same time, we can also consider how, from a social theory of learning, the trajectory that tends to an epistemology of practice has moved gradually towards the definition of practice as the container of knowing, and especially of that form of knowledge that is tacit, that has the form of sensible knowledge embodied in participants' senses, that is distributed and embedded in social relations within the community, and that is often beyond participants' awareness. Therefore, practices are initially conceptualized as the locus of learning and knowing, and the reason behind the rediscovery of the concept of practice was to maintain a distance from both a cognitive conception of learning and a concept of knowledge as a commodity (Gherardi 2000).

The second process that we have illustrated relates to embedding knowledge in material practices. Working practices take place in an equipped environment and a situational territory (Suchman 1996). In other words, a workplace ought to have been prepared so that it has the relevant objects, tools, materials, texts, information and so on at hand and previously appropriated to be put to use within a practice. In the trajectory that moves towards an epistemology of practice, the concept of technology as something other than technological determinism and technological practice has been significant. The literature on online communities, distance work and using ICT has been central to the process of decentralizing the human subject as the prime actor and carrier of knowing and acting, in favour of a symmetrical relationship between humans and materiality. In this case, practices embed materiality and discursivity, and, in the weak concept of sociomateriality, practices are mutually constituted in the relationship between knowing and practising.

In the third process—innovating as an ongoing process—we see the realization of the strong programme aspect of the conceptualization of sociomateriality. Not only has the distinction between learning and innovating collapsed, but the separation between knowing and practising has also been abandoned in favour of a relationship of equivalence. All the elements in a practice are

enacted in the process of practising, and acquire agency by being connected to one another. The performativity of working, organizing and innovating in practice represents a move from understanding people, technologies and discourses that are each characterized by essential properties and boundaries that mutually interact, towards considering the ways in which all the elements are enacted and re-enacted in practice.

A social perspective on knowing is based on three types of relation established between practices and knowledge (Gherardi 2006: 64):

- a relation of *containment*, in the sense that knowledge is a process that takes place within situated practices;
- a relation of *mutual constitution*, in the sense that the activities of knowing and practising are not two distinct and separate phenomena but interact and produce each other;
- a relation of *equivalence*, in the sense that practising is knowing in practice. The equivalence between knowing and practising arises when priority is denied to the knowledge that exists before the moment in which it is applied, that when this takes place it is not something pre-existing that is performed; rather, the action creates the knowledge formed in and through the action itself.

This three-way distinction has been taken up by other authors (Marabelli and Newell 2012; Nicolini 2011), who have proposed that the term 'equivalence' be replaced by 'radical' in order to place more emphasis on the direction that practice-based studies take when they leave behind the concept of knowledge as a possession or commodity. We do not disagree with these authors, but we prefer to keep 'equivalence', since it is less value laden. In Table 7.1, therefore, we summarize the three directions taken by research on knowing and practising since its initial formulation within CoP to the epistemology of practice as developed in contemporary literature.

In reading Table 7.1, we can appreciate that a social perspective on knowledge management is not a monolithic construction but one with different nuances that has taken several turns in the period between the appearance of the concept of CoP and the development of practice-based studies. Therefore, instead of stressing differences, we prefer to underline similarities, and reconstruct a line of thought that does not create an opposition between knowledge as a commodity and knowing as a situated practice.

Table 7.1 Three relations between knowing and practicing

Knowledge Management Processes	Where knowledge is	How knowing is accomplished in practice	Relations between practice and knowledge
Sharing knowledge between experts and novices	Embedded in social relations Embodied in participants' bodily skills	Learning takes place through skilled participation in a practice. Through tacit knowing, cultural heritage and sensible knowledge transmitted to novices.	*Containment*: communities of practice and practices are the locus where knowledge is stored and transmitted.
Embedding knowledge in material practices	Embedded in objects, technologies, and infrastructures. Embedded in material arrangements	By anchoring a practice and objects, technology and infrastructures that characterise the action context. Weak approach to sociomateriality.	*Mutual constitution*: practicing and knowing are mutually constituted. In the weak approach to sociomateriality, the material world is imbricated in practices but is external to practicing.
Innovating knowledge as an ongoing processes	Embedded in the ongoing *agencement* of all practice elements Embedded in temporality	By radically refining, redeveloping or innovating a practice Performing sociomaterial relations and enacting practice elements Strong approach to sociomateriality.	*Equivalence*: knowing is practicing, practicing is knowing. In the strong approach to sociomateriality, practicing is a sociomaterial *agencement* of connecting elements, thus acquiring agency. No distinction between learning, knowing, innovating, and practicing.

Conclusions

A social perspective on knowledge management that originates first in the concept of communities of practice and later in the knowing-in-practice approach assumes and proposes a change in the conception of knowledge. Following the move from nouns to verbs (Law 1994) that has proved so fruitful in shifting scholars' attention from 'organization' to 'organizing' (Clegg et al. 1996), once

we shift from 'knowledge' to 'knowing' we can look at knowing as an activity that is performed collectively while working, organizing and innovating. Therefore, from a cognitive approach to knowledge as something taking place within an individual, we can look at knowing as a collective activity situated in working practices, and this view collapses the divide between knowing and acting. From this standpoint, the meaning of management is also challenged, since by considering 'managing' instead of 'management', we can look at a collective activity that is distributed, fragmented and ongoing in everyday organizational life. Both knowing and managing are conceived as processes that emerge from and are embedded in situated practices.

While an epistemology of knowledge possession directs scholars' attention towards inquiring about knowledge as an object, a resource, a tangible asset, a competence, a capacity or something that can be transferred, an epistemology of practice tends to study how knowing is accomplished within sociomaterial relations from an empirical perspective. Sociomateriality implies that the social and the material (bodies, technologies, tools, artefacts and contexts) are entangled, meaning that the material is social and the social is material. All the elements of a working practice—humans and their bodies, the materiality of the working environment, the knowledge mobilized, and the social structures and emotional and affective relations circulating within it—are entangled and enacted in practising. They do not pre-exist their enactment, even though we may be able to identify knowledge resources and managerial structures that are in place before practices are accomplished. Nevertheless, when we say that practising is emergent and not fully controllable, we mean that the way in which all practice elements become connected and acquire agency through their connections cannot be completely anticipated. A situated practice can be seen as the temporality and spatiality between plans and situated action (Suchman 1987). In other words, plans may be identified in the infrastructure for knowledge management that express an *a priori* rationality, while situated practices of knowing and managing enact a rationality *a posteriori*.

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8

Knowledge Management, Power and Conflict

Helena Heizmann

Introduction

There is a pervasive tendency in knowledge management (KM) research and practice to downplay or ignore issues of power and conflict (Heizmann and Olsson 2015; Kärreman 2010). Yet such issues are central to KM research and practice in more than one way. They shape the identities and struggles of those involved in and/or affected by KM projects; they underpin how teams and communities share and generate knowledge across professional, functional and organisational boundaries; and can be traced in conflicts over knowledge ownership between employers and employees. Perhaps more importantly even, issues of power and conflict co-constitute the 'conditions of knowing' (Blackler 1995) that underpin and regulate organisational practice. As such, they determine why some KM programmes and initiatives are considered as 'best practice' while others are spoken about as 'failures'; and how specific value statements about 'appropriate' KM practice are (re-)produced in some (temporal, sociocultural and/or historical) contexts while lacking authority in others.

More broadly stated, an examination of power and conflict brings to light the plurality of interests within and across organisations and calls into question consensus-based views that consider conflict as 'a persistent problem which needs to be overcome and nullified if learning is to take place' (Easterby-Smith and Araujo 1999: 5). An 'overemphasis on integration' and the

H. Heizmann (✉)
UTS Business School, University of Technology Sydney, Ultimo, NSW, Australia

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'suppression of conflict' too easily sanctions particular forms of knowing and learning as the only valid organisational practice, while preventing others from coming to the fore (Kärreman 2010: 1410). Yet it is clear that such unitarist tendencies may not only mask underlying tensions but also preclude questions into how power/knowledge relations shape the ethics, inclusiveness and democracy of organisational knowledge cultures.

Issues of power and conflict have also been considered too often through a single frame only: the view of power as the capacity to exercise control over others ('power over') through a variety of political tactics and resources, and its destructive implications for harmonious social relations. However, in the broader social sciences, the discussion about power has long widened. What is here promoted is a more complex understanding of power as a concept that may be seen through a number of frames, each rendering visible clusters of ideas that may conflict and overlap (Haugaard and Clegg 2009). Thus, 'power is not a single entity' (2009: 3) and the conflicts that power engenders are best examined with that complexity in mind.

Accordingly, this chapter seeks to draw out central perspectives on power in the wider social sciences and discuss these in relation to contemporary debates on power and conflict in KM. Drawing on the work of Hardy (1996; Hardy and Leiba-O'Sullivan 1998) and others (Clegg 1989; Lukes 1974), the chapter first outlines four different levels or 'layers' at which power may be examined and sheds light on their relevance for KM. The argument put forward in this chapter is that KM literature may benefit, in particular, from paying greater attention to the deeper levels of power referred to here as 'process power', 'meaning power' and 'systemic power'. The chapter offers an empirical illustration of the different layers of power, before concluding with a synthesis and implications for theory and practice.

Different Layers of Power in Knowledge Management

Power operates at a number of different levels (see Clegg 1989; Hardy and Leiba-O'Sullivan 1998; Lukes 1974), which are grounded in different sociological paradigms that have received varying attention in KM research and practice (Schultze and Stabell 2004). Figure 8.1 provides an overview of these layers, which include resource power, process power, the power of meaning and systemic power (Hardy 1996; Hardy and Leiba-O'Sullivan 1998). In the following sections, the nature of these layers will be discussed with reference to existing KM literature.

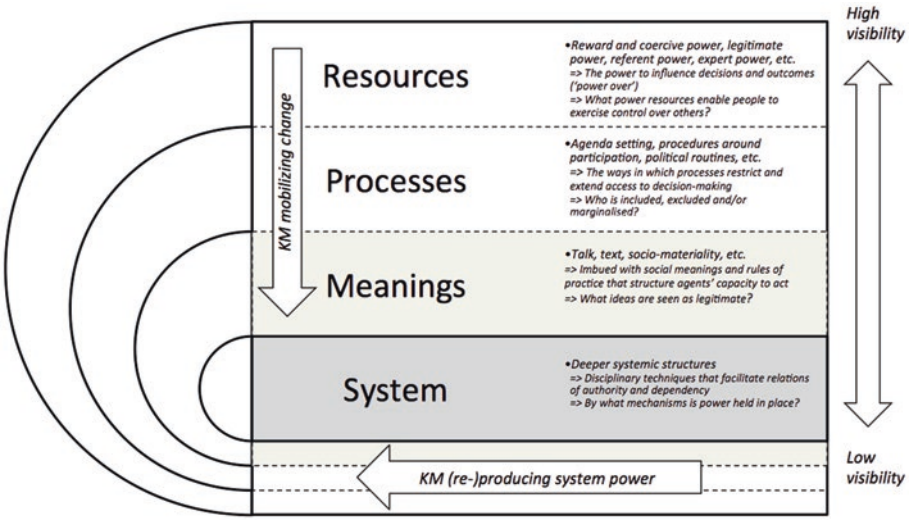

Fig. 8.1 Layers of power in KM

The Power of Resources

From a resource-based perspective, power is generally understood as a means to exercise control over people or, as Hardy puts it, 'the ability to get people to do what you want them to do' (Hardy 1996: S7). Possession of, or access to, power resources is seen to give actors the ability to influence particular target individuals and/or decision-making outcomes in a situation of conflicting interests. While the list of possible power resources may well be seen as 'infinite', with their potency being contingent on the specific context of usage (Hardy and Clegg 2006: 757), French and Raven's (1959) typology of five primary 'bases' of resource power has been particularly influential in KM literature:

- reward power (power derived from the ability to administer rewards for a desired behaviour);
- coercive power (power derived from the ability to punish noncompliance with a desired behaviour);
- legitimate power (power derived from an organisational position);
- referent power (power derived from attracting high levels of identification, respect and/or admiration);
- expert power (power derived from holding knowledge, expertise or skills that are considered valuable in a particular context).

Embedded in the discourse of the 'knowledge economy', and drawing from a neo-functionalist paradigm (Schultze and Stabell 2004), KM literature has placed particular emphasis on French and Raven's (1959) fifth category—the role of knowledge as a resource for expert power. Indeed, 'knowledge is power' has become a buzzword in the KM literature (Heizmann and Olsson 2015), referring to the power of individual experts in holding scarce and often tacit knowledge that is considered valuable from an organisational perspective. Behind this lies a central KM dilemma: How can valued and scarce expert knowledge be made available more widely to increase the organisation's performativity? Or, asked differently, how may wider organisational interests be served by disseminating and/or rendering transparent the expertise and skills of individual knowledge workers?

While mainstream neo-functionalist KM literature rarely attends to power relations per se (Heizmann and Olsson 2015; Kärreman 2010), a substantial body of literature has focused on issues of knowledge-hoarding and/or selective knowledge-sharing (cf. Rechberg and Syed 2013), thereby drawing implicitly on a resource-based view of power. The goal of this strand of the KM literature has generally been the development of a better understanding of the ways in which employees may be incentivised to share their 'intellectual capital' and increase their commitment to KM.

One suggestion to this effect has been a closer examination of the role of individuals with legitimate/positional power, arguing that such leaders may encourage knowledge workers to act in ways supportive of KM (Bunderson and Reagans 2011; Jayasingam et al. 2010; Politis 2005). For instance, Bunderson and Reagans (2011: 1182) contend that leaders who 'use their power and status in more "socialized" ways can play critical roles in stimulating collective learning behavior'. Differentiating further between the social bases of power, Jayasingam et al.'s (2010) study of the links between top management and KM finds that top leaders who are ascribed with expert power are particularly successful in encouraging knowledge acquisition and dissemination practices, while legitimate, reward, coercive and referent power were found to have limited or even adverse effects on KM.

Alongside this focus on leadership, another strand of the literature has emphasised the importance of technology-enabled approaches and human resources management (HRM) practices to foster knowledge-oriented behaviours among employees. Such solutions include Web 2.0 platforms and virtual communities of practice (Ardichvili et al. 2003; Matschke et al. 2012; Teo et al. 2011), as well as a range of often sophisticated HRM strategies (e.g., reward and appraisal programmes, training and mentoring, organisational development initiatives) (Cabrera and Cabrera 2005; Carnelo-Ordaz et al.

2011; Giauque et al. 2010; Swart and Kinnie 2003, 2010) that seek to 'normatively' develop the organisation's knowledge culture through the prescription of specific values, beliefs and behaviours (Alvesson and Kärreman 2001).

Conflict is considered in much of this literature as an organisational dysfunction that may be 'managed' through the effective use of power resources (Rawas et al. 1997). Underpinning this body of work are thus unitarist assumptions that individual and organisational interests may be aligned if appropriate leadership behaviours and well-designed KM programmes and technologies are 'implemented'. However, this perspective overlooks how employees (just as employers) are subject to the power effects of the new 'knowledge economy' (Bergström et al. 2009) and thus likely to construct personal knowledge as a resource that secures personal status and 'market value' (Rechberg and Syed 2013; Wang et al. 2009). Therein lies a deeper employment relations conflict, which is difficult to reconcile (Contu and Willmot 2003; Coopey 1995). The discourse of the 'knowledge economy' breeds knowledge workers that, perhaps not surprisingly, understand the value of their knowledge and prefer to hoard it (Michailova and Husted 2003; Wang 2004) or share it selectively (Willem and Scarbrough 2006).

The Power of Processes

While the resource-based perspective sheds light on how power 'functions' in influencing decision-making outcomes in a scenario where conflicting interests are transparent, the power involved in specific organisational decision-making *processes* is less often attended to in KM literature. This form of power is, at its core, about the ways in which access to decision-making may be restricted and/or increased to further the interests of particular groups over others. Organisational literature focusing on this dimension of power has highlighted, in particular, how dominant groups have prevented open conflict or confrontation through 'a variety of procedures and political routines' (Hardy 1996: S7), including influencing who has access to decision-making forums and shaping the process and nature of agenda-setting. In this way, 'some things may never make the political agenda; they are, either implicitly or explicitly, ruled out of bounds, hence they are not raised' (Clegg and Pitsis 2012: 68).

In the KM literature, studies on the politics of innovation have been particularly effective in exposing the process dimension of power (Filstadt 2014; Hislop 2003; Mørk et al. 2008, 2010; Swan et al. 2002, 2005). This is because innovation processes tend to render visible how existing claims over

professional authority are always tenuous, contestable and 'at stake' (Carlile 2002). For instance, Scarbrough and Swan (2005) examine the political dynamics that shape innovation in KM networks within and between organisations. Their study finds that political tactics such as the careful selection of team members, the appointment of 'opinion leaders' outside of firms, and the manipulation of information flows play an important role in determining the interests that prevail in networked forms of collaboration. Thus, the politics of processes—in this case, the ways in which agents formed and coordinated the networks—took on a higher importance than asymmetries in resource power. In a similar vein, Swan et al. (2002) find that community-building across diverging interest groups plays a central role in neutralising professional conflict and minimising resistance to innovation. Building on this line of thinking, Mørk et al. (2010) examine changing power relations in the context of two medical innovation projects, highlighting, in particular, how the emergence of new practices may challenge established master–apprentice relationships that exist within and across communities of practice (CoPs). The authors' analysis illustrates incisively how boundaries of practice and authority are redrawn in the unfolding of political processes and negotiations over changing practices. This brings to the foreground not only how conflict is an intrinsic part of changing professional practice but also 'how practices' themselves 'perform power effects' (Mørk et al. 2010: 587), empowering some actors while disempowering others. As in Filstadt (2014), this may lead to the exclusion of others from decision-making processes and narrow sense-making and sense-giving of new knowledge. Collectively, these studies suggest that communities and networks of practice may not only act as 'vehicles of innovation' but also as barriers to change (Hislop 2003; Mørk et al. 2008; Swan et al. 2002) and to tools to 'mobilise' and 'legitimate' interests and changes in work practice (Mørk et al. 2010; Swan et al. 2002, 2005).

While process power is less visible than the power of resources, it converges with this first layer of power in that it is premised on the notion that power is exercised in an arena of conflict and oppositional interests (Hardy and Leiba-O'Sullivan 1998: 455), as well as in retaining a sovereign view of power that ties power to agency and day-to-day interactions. While these two dimensions of power may be seen as constituting the outer layers of how power operates in organisations (see Fig. 8.1), organisational research, since the work of Lukes (1974), has also considered a third 'radical' dimension of power: the power embedded in meanings. This form of power operates at the interface of micro-level agency and macro-level structures and has important implications for the study of KM.

The Power of Meaning

While the prevailing resource-based view on power considers power as a stable resource that people possess and 'wield over' others, it does not explain *why* specific resources hold authority in a given domain of practice and *why* practitioners tend to act routinely in certain ways rather than others in such domains. This perspective leads to an analysis of power at a deeper level, that is, in particular, a better understanding of the ways in which certain interests come to be legitimised or de-legitimised through discursive practices and strategies that shape meaning (Hardy 1985; Pettigrew 1973; Vaara and Tienari 2008; Vaara et al. 2006).

The concept of the power of meaning was first introduced by Lukes (1974) as a third 'radical' dimension of power that may be engaged to prevent conflict from emerging in the first place (Hardy and Leiba-O'Sullivan 1998: 455) through shaping individuals' 'perceptions, cognitions, and preferences' (Hardy 1996: S8). In the KM literature, research on this third layer of power has been influenced, in particular, by Foucault's theory of power/knowledge (1977, 1978, 1980), which sheds light on the ways in which meanings are created, contested and transformed to legitimate particular outcomes, decisions and courses of action. Power and knowledge, in this view, are two sides of the same coin (Heizmann and Olsson 2015): Power shapes what constitutes 'valid' knowledge in the form of discourses, while the existing 'order' of discourses holds particular power relations in place. Discursive practices are thus not neutral but imbued with social meanings and rules of practice, the tacit 'rules of the game', that inscribe what constitutes 'good' practice, membership and authority (Clegg 1989). Importantly, such discursive practices are enacted not only in talk and text but also—as a number of authors have pointed out (Hardy and Thomas 2015; Heizmann and Fox 2017; Mørk et al. 2012; Oswick and Robertson 2009)—in forms of sociomateriality (e.g., office design, boundary objects) that carry specific meanings with power effects.

Studies on the power of meaning in KM literature focused originally on the team, community and network level (Ferguson and Taminiau 2014; Heizmann 2011; Marshall and Rollinson 2004; Oborn and Dawson 2010; Omrod et al. 2007; Swan et al. 2005), but they have recently also expanded to the study of power/knowledge effects in boundary relations *across* teams, communities and networks of practice (Heizmann and Fox 2017; Hong and Fiona 2009; Mørk et al. 2008, 2010, 2012).

Marshall and Rollinson's (2004) study of a problem-solving encounter offers an application of an episodic, group-level analysis of conflict. The

authors show how power is 'always in the making within specific episodes, provisional, negotiated and emergent' (Marshall and Rollinson 2004: S81), rather than a stable resource that actors possess. Their findings thus suggest that 'expert power' should be reframed as 'expertise-as-power' that is enacted, challenged and legitimated in day-to-day encounters, where different power/knowledge claims interact and intersect. Through this form of analysis, Marshall and Rollinson (2004) are able to shed light on the ways in which the 'politics of interpretation' (Weick 1995) give rise to conflict and shape actors' daily communication practices.

These insights into the nature of group conflict (and consensual relations for that matter) as being emergent in the negotiation of meaning between different power/knowledge claims have since been supported by further studies in online communities (Ferguson and Taminiau 2014), CoPs (Heizmann 2012; Mørk et al. 2010), multidisciplinary teams (Oborn and Dawson 2010) and networks of practice and/or innovation (Heizmann 2011; Omrod et al. 2007; Swan et al. 2005). Contrary to the idealist KM rhetoric surrounding these types of groups, these studies highlight conflict and tensions as an inherent feature of the dynamics of continuity and discontinuity in various domains of practice. (Lave and Wenger 1991).

Meso-level studies of cross-boundary relations have added to this layer of understanding, not only by examining conflict on a wider scale but also by showing how groups may not be presupposed but are rather constituted, maintained and/or transformed via the discursive practices of their members (Contu 2013; Gherardi 2006; Gherardi and Nicolini 2002; Heizmann 2011). Practice-based studies on knowledge and learning (see Feldman and Orlikowski 2011; Gherardi 2000, 2006; Nicolini 2013), in particular, promote a relational ontology that links power to the constitution of differences and dependencies within and across practices (Contu 2013; Østerlund and Carlile 2005), as well as to the constitution of practitioners' subjectivity (Contu 2013; Fox 2000; Handley et al. 2006; Heizmann 2011). As Contu (2013: 293) argues,

> what becomes intelligible, such as social relations and the specific identities of the subjects participating in it (e.g. expert/learner, technical/creative professional, manager/worker), are the results of a sedimented yet continuous hegemonic struggle. This is defined as the never-ending process of articulating and maintaining distinctions (the specific differences between 'this' rather than 'that').

Seen from this perspective, the *mutual co-constitution* of practices and meanings (or discourses, rather) takes centre stage, thereby offering researchers a route to gaining a more *relational* and *emergent* understanding of power dynamics in cross-boundary relations.

The Power of the System

The three layers of power discussed so far shed light on the ways in which KM and knowledge practices contribute to particular knowledge cultures or organisational 'regimes of knowing' (Carter and Scarbrough 2001), which can be seen both through the lens of organisational change and organisational continuity (see Fig. 8.1). However, these dimensions are insufficient in explaining why particular KM practices and programmes may be constructed as failures or successes and, more importantly, how such outcomes are tied to disciplinary techniques at a deeper *systemic* level that constitute the conditions for both agency and subjectivity.

> We must not ignore the power embedded deep within the organizational *system* that everyone takes for granted. This power is often beyond the reach of tampering by organizational members. It lies in the unconscious acceptance of the values, traditions, cultures and structures of a given institution and it captures all organizational members in its web. […] This power is the backdrop against which all organizational actions and decisions take place. (Hardy 1996: S8/9)

Post-structuralist perspectives (see also, 'the dialogic discourse in KM', Schultze and Stabell 2004) have been particularly significant in shedding light on the deeper systemic dimension of power, that is, the power in which 'everyone is caught', the privileged as much as the marginalised (Foucault 1980: 156). This form of power is not tied to particular agencies or relations of domination (e.g., the power of top management) but, rather, ought to be seen as a series 'network' effects (Foucault 1977: 26) that empower or disempower agency at the episodic level (Clegg 1989). These network effects are produced through an assemblage of disciplinary techniques and technologies that seek to stabilise and 'fix' particular power/knowledge relations (Clegg et al. 2006; Fox 2000; Townley 1993). Seen from this perspective, power is not restrictive and prohibitory but productive, that is, it generates and enables particular agencies and forms of identification. Ultimately, it is through the individual's subjugation (Knights and Willmot 1989) to such forms of agency and identity that the 'disciplinary' effects of power arise.

Empirical analyses of system power—the deepest layer of power—remain rare in KM literature, though a number of notable exceptions exist (Bergström et al. 2009; Carter and Scarbrough 2001; Clegg and Ray 2003; Garrick and Clegg 2001; Heizmann and Fox 2017; Mørk et al. 2008). At the organisational level, studies have sought to expose the discursive regimes that characterise specific institutions and the ways in which these are held in place by

disciplinary techniques and technologies (Carter and Scarbrough 2001; Heizmann and Fox 2017). For instance, Carter and Scarbrough's (2001) study of a regional electrical company illustrates how the firm shifted, within the space of six years, from a 'regime of knowing' that prioritised engineering concerns to a managerialist regime of knowing that constructed company success through customer satisfaction. Importantly, the company's KM programme played a pivotal role in shifting the firm's power relations by codifying and thus 'demystifying' the work of professional engineers. This also highlights how systemic power is deeply interwoven with the power of meaning: Along with a series of disciplinary techniques that accompanied the firm's KM implementation (e.g., a rule-based engineering initiative, greater visibility of customer satisfaction ratings), the 'truth claims' around what constituted company success shifted. This leads Carter and Scarbrough (2001: 218) to conclude:

> The very demonstration of the far reaching effects of the [KM] initiative highlight the absurdity of treating Knowledge Management as an initiative that is in some way neutral or apolitical. Instead, it demonstrates that *power is at the heart of KM* [emphasis added], in this case enabling the destruction and replacement of one entrenched regime of knowledge by another.

Building on an understanding of the systemic layer of power, another strand of the literature has shed light on the disciplinary effects of KM at the agency level (Bergström et al. 2009; Fischer et al. 2016; Garrick and Clegg 2000, 2001; Harman 2011; Heizmann and Fox 2017; Kärreman and Alvesson 2004). This body of literature has drawn attention to what may be considered the 'dark' side of KM: in other words, the ways in which KM practices colonise knowledge workers' 'imaginary realm' by exercising a form of socio-ideological control that regulates identities, beliefs, emotions and social relations—thus being complicit in the construction of an 'iron cage' of subjectivity (Kärreman and Alvesson 2004). Garrick and Clegg (2000) go as far as identifying a gothic narrative in KM: Organisations, akin to a count Dracula, deploy a values-based rhetoric and disciplinary techniques to 'seduce' their members to become sharing and collaborative agents; only, in this scenario, once the precious resource is offered, employees become subjected to stricter performance regimes, or worse, face the threat of redundancy. From such a critical standpoint, KM may in fact be seen to act as a vehicle of 'soft power' (Courpasson 2000) that coopts employees' participation in the KM agenda to further managerial interests.

Empirical Illustration

In the following, the mechanisms by which the four levels of power operate are further illustrated by drawing on an empirical case. The data are drawn from an in-depth year-long qualitative study at InsuCo Australia, an insurance firm that forms part of a large multinational insurance corporation with more than 10,000 staff worldwide. The study included observations, document analysis and semi-structured interviews with 30 InsuCo staff (HR professionals, line managers, senior managers) during the early stages of transition to a shared services model. This transition was facilitated by a number of KM initiatives, including mapping of domain knowledge, corporate promotion of CoPs, and a series of learning and development programmes. The detailed methodology and findings of this study are documented elsewhere (Heizmann 2011, 2012; Heizmann and Fox 2017).

A central component of InsuCo Australia's organisational change process was a shift in the way the human resources (HR) function operated in relation to line managers, that is, from a traditional (back-office) personnel function to a centralised 'Centre of Excellence' which invited line managers to collaborate more closely with their 'HR partners'. This involved changes to the work design of line managers, who were now expected to deal with HR 'people issues' directly, in consultation with and supported by their HR business partner. This repositioning of the HR function, framed as a shift to a HR Business Partnership model (Ulrich 1997), constituted an effort to promote more effective knowledge-sharing and generation (1) within the HR function (i.e., across the different specialist communities), and (2) between the HR and line management communities of practice. Drawing on the previous theorisation (see Fig. 8.1), the role of power in this KM change process could be examined as follows.

A Resource-Based View

While HR professionals were seeking to change their collaboration with line managers and the way line managers worked, they could be seen to hold limited resources to enable this change. As 'business partners', they did not 'wield' positional authority over line managers (legitimate power) and were thus virtually powerless in their ability to reward and/or punish line managers for failure to comply with the changes to their work roles (reward and coercive power). HR managers thus described their position as a more 'contemporary' framing of their previous role that required increased 'influencing skills'. In

order to collaborate and share knowledge with line managers, HR managers were effectively reliant on their ability to build trust and respect (referent power) and have their knowledge accepted as a valuable resource by line managers (expert power). However, while some HR practitioners were able to build positive knowledge-sharing relationships with their clients, the majority found that relationships were strained and characterised by significant power imbalances. From a resource-based perspective, this could be understood in the context of the HR function's lack of power 'over' financial resources, a challenge that is common to HR functions and other shared service functions. As one of the participants of the study noted, *we don't have … we don't bring in money and that's a big thing in this organisation. That's across all organisations … we're a cost. That always makes a big difference*. (HR Business Partner) An important implication of this power dynamic was a marked scepticism, lack of prioritisation and/or resistance of line managers towards KM initiatives that were led by the HRM function (Sheehan et al. 2014).

A Process-Based View

KM played an integral part in InsuCo's shift to a shared services model, with KM initiatives ranging from IT-based solutions designed to map and store knowledge of the various service functions to people-centred solutions that were designed to promote specific corporate values and community-based learning. However, a closer examination showed that people-centred solutions that attracted institutional funding were limited to staff that either held management positions at the time or had been pre-identified in talent management processes as 'emerging leaders' and/or 'high potentials'. This strategy was based on implicit assumptions that changes to the organisation's culture could be achieved most efficiently by developing the values and beliefs of an 'elite' group of staff, whose behaviour would then create a 'trickle down' effect. The development of leadership CoPs, for instance, was seen as a means to promote a particular set of 'core behaviours', consistent with Alvesson's conceptualisation of KM as a form of normative control (Alvesson and Kärreman 2001). However, from a process-based perspective, InsuCo's leadership CoPs had important power implications. Not only did they carry expectations for specific forms of performativity, they were also established as relatively 'exclusive' clubs in which important organisational decisions were pre-empted without other groups of staff being able to partake in the discussions. In this way, CoPs played a role in reinforcing managerial power and interests while excluding other voices within the organisation and minimising open conflict and debate.

A Discursive View

The 'power of meaning' played an important role in various conflicts that surfaced as part of the organisation's change efforts, including both intra-functional (Heizmann 2011, 2012) and cross-functional conflicts (Heizmann and Fox 2017; Heizmann and Olsson 2015). In particular, this lens adds another layer of understanding to the previously described difficulties of HR managers to change the nature of their collaboration with line managers and establish themselves as 'HR business partners' (Ulrich 1997). Rather than simply being an issue of unevenly balanced 'resource power' between HR and line managers, this relationship was also characterised by struggles over 'truth', where both parties sought to legitimise their own values and beliefs in order to achieve specific outcomes. This 'legitimation project' (Heizmann and Fox 2017) did not only shape the talk of HR managers in their social interactions with line managers (e.g., 'You want to put it in their language if you can. So if you're trying to sell an idea, you sell it through the business impact for example' (HR manager)); it also became manifest in the way textual and other physical objects and arrangements (e.g., HR strategy documents, development plans, workshop facilities) were designed to promote particular 'power/knowledge' claims around 'appropriate' line management performance. A particularly potent example was the HRM function's implementation of an organisational culture survey that measured how effective specific units were in terms of their knowledge-sharing and communication behaviours. The survey was imbued with meanings about effective team leadership (in line with the KM agenda), which were disseminated throughout the organisation as part of the implementation. While contributing to gradual changes in line managers' behaviours, this also created a new set of power relations, since line managers became increasingly dependent on the HRM function's support in their efforts to develop more effective communication and knowledge-sharing practices in their teams (Heizmann and Fox 2017).

A Systemic View

While the previous sections highlighted how KM may mobilise organisational change through the power of resources, processes and discourses, KM can also be examined as a set of disciplinary techniques that help institutionalise and hold in place particular power relations, thereby reinforcing the 'power of the system'. Indeed, InsuCo's KM practices had inscribed taken-for-granted 'values, traditions, cultures and structures' (Hardy 1996: S8) that had long been

part of the organisation's 'conditions of knowing' (Blackler 1995), determining what 'counted' as knowledge and appropriate performance and under what conditions. For instance, the previously discussed organisational culture survey was not only a tool designed to change leadership behaviours in ways that fostered specific forms of communication among staff, it was also a surveillance device that rendered publicly visible line managers' performance as team leaders and their 'deficits' in building and retaining an engaged workforce. This was more effective than previous attempts in changing leadership discourse at InsuCo, as it was presented in ways that were consistent with InsuCo's prevailing 'bottom-line first' discourse. Thus, while KM practices at InsuCo derived their apparent success from being aligned with a discourse that prioritised financial results, they also reinforced InsuCo's prevailing power of the system. This rendered 'powerless' alternative ways of constituting the organisation's knowledge culture, including, for instance, an appreciation for organically developing knowledge communities and informal knowledge-sharing mechanisms. As summed up by one staff member: 'They're not interested in people's stories as much as they are in numbers, bottom line.'

Conclusions and Implications

Synthesis

This chapter has, so far, highlighted that issues of power and conflict are intrinsic to KM research and practice, even though they have only recently begun to attract greater levels of attention. The four layers of power discussed in this chapter allow for a richer and more nuanced understanding of the topic by providing a set of different meta-theoretical lenses. Specifically, the framework offers insight into how: (1) power *resources* (including knowledge and expertise) are distributed unevenly in organisations and therefore afford actors differing levels of influence over others; (2) KM *processes* play a role in privileging, marginalising and/or excluding particular interests and forms of knowledge, thereby shaping organisational outcomes and decisions; (3) day-to-day power/knowledge claims as well as broader KM programmes enact deeper discursive structures that (de-)legitimate *meanings* and shape the nature of the organisation's knowledge culture; and (4) institutional and sociocultural *systems* incorporate disciplinary techniques that seek to stabilise and fix power relations, thereby creating particular conditions of knowing and being in the world.

Much as in wider organisational literature (see Hardy and Clegg 2006), the first layer of power has received more attention than the deeper levels of power in KM research. Conflict is here seen, essentially, as a dysfunction that ought to be eradicated for organisational learning and KM to function effectively (Easterby-Smith and Araujo 1999). Deep-rooted in the neo-functionalist paradigm, this body of research is concerned primarily with questions of corporate performativity (Schultze and Stabell 2004). The lens of process power adds another dimension to this perspective by recognising that conflict may be prevented from coming to the surface through specific processes that restrict and extend access to decision-making. However, if similarly allied with the neo-functionalist paradigm, this perspective upholds the assumption that conflict detracts from the effective functioning of the organisation, and so concludes that KM practices must play a role in preventing conflict before it arises. It is only through bringing in the third layer of meaning power and its recognition of dissensus as an immanent feature of organisational life, that the notion of conflict as an organisational 'problem' begins to weaken. Conflict between different interests, particularly if brought to the surface as 'productive differences', may now be seen as the co-producer of creativity, change and integral to the co-creation of shared social worlds (Gergen et al. 2004). Moreover, what constitutes 'effective' and 'legitimate' KM practice is then not a question of essentialism but contingent on prevailing discourses that determine how power/knowledge is enacted *and* accepted in situ. The fourth layer of power, finally, situates these questions within a broader institutional and sociopolitical context, highlighting how conflict-laden relations are not only embedded in 'battles for truth' (Foucault 1980) but also held in place and stabilised through an interplay of 'disciplinary techniques' (Foucault 1977) and 'technologies of the self' (Foucault 1988). This systemic layer also invariably raises questions of ethics in relation to KM. Indeed, a more ethically reflexive and power-sensitive form of social science would suggest that the suppression of conflict suppresses freedom and diversity (Flyvbjerg 2001), and that such restriction hinders the development of greater levels of trust and mutual understanding (Raelin 2012).

Implications for Research and Practice

While there is value in recognising and considering all four layers of power, this may not always be possible, or indeed constructive, in a single research endeavour (Schultze and Stabell 2004: 568). Theoretically, the four layers of power have originated in the context of specific epistemological and ontological

assumptions, many of which are not readily compatible. For instance, as Contu (2013: 290) argues, practice-based theorising is 'ill at ease' with viewing power 'as the ability to mobilise a resource'. Indeed, practice theory's relational ontology is so distinct that efforts to align the two perspectives may quickly run the risk of corrupting one or the other. Similarly, post-structuralist discourse studies and critical realist studies have much to offer in the realm of meaning power, but their underlying tenets are substantially different and, consequently, they will yield different analyses and results. However, these challenges do not and should not preclude dialogue across the research paradigms. Researchers and practitioners may become aware of the limitations and blind spots of one paradigm by engaging critically and (self-)reflexively with the other. For instance, neo-functionalist KM research may benefit from considering the 'disciplinary' effects of KM tools on knowledge workers (Schultze and Stabell 2004: 568) and their long-term implications on issues such as employee well-being, creativity and organisational cohesion. Similarly, dialogic (post-structuralist) KM research can expand critiques of existing frameworks and understandings of corporate performativity by exposing counter-perspectives that have been overshadowed by dominant discourses and that may generate new possibilities for practice.

The earlier discussion in this chapter has suggested that the deeper levels of power require greater attention in KM research, arguably because critical and dialogic perspectives continue to be underrepresented in KM (Schultze and Stabell 2004). However, it has also highlighted areas where advances have been made. Building on these insights, two more specific directions for future research and practice emerge.

The first is to consider more explicitly and in a wider range of contexts the mechanics of KM as a form of normative (technocratic and socio-ideological) control (Alvesson and Kärreman 2001, 2004). KM incorporates a set of techniques and tools that can be seen to have 'disciplinary' effects, though it remains less clear how these techniques operate on the individual. More recently, some authors have thus suggested attending not only to the 'technologies of power […] as the ways individuals turn into subjects' but also to the 'technologies of self as the ways people turn themselves into subjects' (Harman 2011: 277). This form of analysis must, crucially, consider individuals' embodiment of specific discourses, that is, how subjects actively constitute themselves in ways that are deeply invested in specific subject positions, including a wide palette of emotional rewards and costs (Contu 2013). The latter affective dimension, in particular, warrants future research, as emotions are still too often considered solely as individual feelings, rather than as intersubjective and social phenomena that interact with power relations, and

thereby shape organisational learning dynamics (Thompson and Willmot 2016; Vince 2001, 2004; Vince and Gabriel 2011). Such future research may also include greater attention to more self-reflexive forms of agency that may challenge and/or alter existing discursive regimes. As Fischer et al. (2016: 1565) note, 'might [not] more agentic subject positions develop, potentially shaping and mobilizing less dominant modes of knowledge?' The latter point raises central questions for KM's emancipatory potential: Might not the cultivation of critical reflexivity (Cunliffe 2004, 2009) and collaborative, dialogic agency (Raelin 2011, 2013, 2016) allow for more emancipatory forms of understanding? And might not such shifts lead practitioners to question their existing assumptions about 'normal' practice and act in ways that are more responsive to the perspectives raised at power/knowledge boundaries, potentially leading to new forms of knowledge and greater organisational cohesion?

Second, and related to the above, we need to consider more carefully the premises and rationalities under which KM operates in institutions and the consequences that this entails for the flourishing of open, inclusive and democratic knowledge cultures (Coopey 1995; Coopey and Burgoyne 2000). Here, questions of ethical and practical wisdom (phronesis), often downplayed or sidelined in KM literature, come to the fore (Flyvbjerg 2001: 131):

(1) Where are we going?
(2) Who gains and who loses, and by which mechanisms of power?
(3) Is this development desirable?
(4) What, if anything, should we do about it?

The above questions are relevant for KM researchers and practitioners alike. They call, essentially, for a consideration of ethics-in-practice (Clegg et al. 2007; Gordon et al. 2009), that is, greater attention to the ways in which power relations, ethics and discursive practice are mutually co-constituted (Gordon et al. 2009: 94) within and through the practice of KM. Here, the interplay between the third and fourth layer of power (meaning and system power), embedded and enacted in practice, is at the heart of the analysis (Hardy and Phillips 2004). Researchers and practitioners must consider how 'ethics are at stake in day-to-day *practices* […] in the *learned and routine ways of doing things*' (emphasis added), as well as in the 'tensions that a new language of change introduces' (Gordon et al. 2009: 94). Tying this form of analysis to the study of KM will likely offer a deeper understanding of the ways in which KM change induces conflict; yet, importantly, it will also illuminate the role that KM plays in reproducing past patterns and rationalities, enacted through organisational

members' discursive practices, and show how these enactments may become contested and transformed via alternative truth claims that challenge the existing apparatus of power.

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9

Knowledge Measurement: From Intellectual Capital Valuation to Individual Knowledge Assessment

Mohamed A. F. Ragab and Amr Arisha

Introduction

A key requisite for success in the current knowledge economy lies in the ability of organisations to recognise the economic value of intangibles, particularly knowledge assets. Measuring what is organisationally valuable and strategically powerful has always been a key business practice that is strongly encouraged in management discourse (Stewart 1998). As popularised by the adage 'if you can't measure it, you can't manage it', the ability to manage any organisational dimension becomes increasingly challenging if not coupled with the capacity to measure what is being managed. Knowledge measurement supports effective knowledge management (KM) by helping managers identify knowledge assets which maybe hidden, unutilised or underdeveloped, despite being the firm's fundamental source of competitive advantage (Edvinsson and Malone 1997). Measurement models also enable the evaluation of the impact of KM initiatives and the justification of the massive expenditure associated with KM projects and systems (Khalifa et al. 2008). They empower managers in the proper governance of the organisation's value creation dynamics and alignment of strategic plans with available human capital (Carlucci and Schiuma 2006; Spender 2006). Furthermore, the widening gaps between companies' market and book values—the former often multiples of the latter—has led to the view that corporate valuation would only be

M. A. F. Ragab (✉) • A. Arisha
College of Business, Dublin Institute of Technology (DIT), Dublin, Ireland

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truly reflective if knowledge assets are valuated along with tangible ones (Skyrme 2003). To this end, a wide range of measurement models have been proposed in the KM literature.

This chapter provides a comprehensive overview of frameworks developed to overcome the measurement challenge in KM. Following the definition of the related concept of intellectual capital, different types of organisational measurement models are critically reviewed. The chapter then focuses on the novel area of individual knowledge assessment, along with the managerial drivers behind it, and argues that it should be regarded as a vital business process to support KM strategy and mitigate the risk of knowledge loss. The final section then presents a practitioners' view of individual knowledge assessment and its underlying elements through the findings of a recent study conducted by the authors.

Knowledge Measurement Models

Knowledge measurement is one of—if not the—most difficult of KM activities, due to the complex and intangible nature of knowledge. Organisational knowledge measurement is often addressed through the related concept of intellectual capital (IC), which is defined as the compilation of organisational knowledge assets that drive organisational performance (Schiuma et al. 2008). It has also been described as the 'stocks' of knowledge held by the organisation at any given time and used for value creation (Bontis 1999). Three main approaches are adopted to assess organisational knowledge, or IC, each focusing on different facets of the firm: a financial approach, a scorecard approach and a performance-based approach. They are discussed in the following sections.

The Financial Approach

Models adopting this approach rely on financial models to calculate a monetary value for IC using data from corporate financial statements. The following are the most prevalent methods.

Tobin's Q

Tobin's Quotient (Tobin 1969) is a tool to evaluate investment decisions proposed by economist James Tobin. It measures the market-to-book ratio of a

company through the valuation of physical assets using their replacement cost rather than their book values. Tobin's theory postulates that a *Q* higher than one and higher than that of competitors indicates that the company owns higher IC, with which it can outperform its rivals creating an 'intangible advantage'. The weakness of this method, however, is that it correlates IC to stock prices, which rise and fall due to numerous other factors than the value of knowledge assets.

Economic Value Added (EVA)

EVA is a financial measure originally introduced as an indicator of shareholder value, which involves applying more than 160 adjustments to the traditional balance sheet to account for intangible assets (Stern et al. 1995). The EVA value is then calculated by deducting the cost of capital from operating profit. It is, therefore, not considered as a direct measure of IC but rather an indicator which suggests that a rise in EVA implies the efficient management of IC.

Human Resource Accounting (HRA)

HRA is developed with the aim of using financial data to quantify the economic value of people as 'human assets' through three types of models: *cost models*, *market models* and *income models* (Hermanson 1964). Cost models value human assets as the cost of their acquisition (their recruitment and training cost), or alternatively the discounted value of employee compensation. Market models, on the other hand, equate human value with the cost of buying an individual's services from the market, for example via consultancy. In income models, human asset value is quantified as the present value of the revenues an employee is projected to generate for the organisation during their tenure. Although HRA provides useful indicators, it relies too heavily on debatable assumptions.

Value Creation Intellectual Coefficient (VAIC)

VAIC is a value-added and IC evaluation method developed by Pulic (2000). Its objective is to measure the efficiency of financial and intellectual capital management in generating value for the firm. It is computed using the following series of formulae:

$$\text{Value Added}(\text{VA}) = \text{Outputs}(\text{revenues}) - \text{Inputs}$$
$$\text{Capital Employed Efficiency}(\text{CEE}) = \text{VA} / \text{CE},$$
where CE is financial capital.
$$\text{Human Capital Efficiency}(\text{HCE}) = \text{HC} / \text{CE}, \text{where HC is}$$
the total labour cost.
$$\text{Structural Capital}(\text{SC}) = \text{SC} = \text{VA} - \text{HC}$$
$$\text{Structural Capital Efficiency}(\text{SCE}) = \text{SC} / \text{CE}$$
$$\text{Value Creation Intellectual Coefficient}(\text{VAIC}) = \text{CEE} + \text{HCE} + \text{SCE}$$

It is noted, however, that VAIC is limited to providing an overview of IC and broadly identifying areas where value creation is deficient. As Pulic recommends, it should be used in conjunction with a more detailed assessment tool.

The Scorecard Approach

The second approach divides IC into different elements and uses a scorecard to evaluate each of them individually. IC is typically broken down into human capital (HC), structural capital (SC) and relational capital (RC), a classification proposed by Stewart (1998). HC includes the combined knowledge, skills and experience of individuals and their motivation to share and use these attributes with the firm to create value (Baron 2011; Carson et al. 2004). It is hence not *owned* by the organisation. SC, on the other hand, is possessed by the firm and includes its business infrastructure such as physical resources, information systems and organisational processes. RC (also referred to as *customer capital*) refers to the company's network of external relationships with stakeholders, such as suppliers and customers, used to drive its business activity. Following classification, scorecard models use quantitative indicators to measure each IC component using both financial and non-financial metrics. Some models then aggregate all measures into a single number using such methods as averages, weighted averages or financial valuations. The following are the key models adopting this approach.

Skandia Navigator

The Skandia Navigator is one of the most prominent attempts to measure IC developed by Skandia AFS, a Swedish insurance company (Edvinsson and Malone 1997). Skandia developed 112 metrics that cover five foci, where each focus relates to a component of IC in addition to a financial focus, and was the

first company to publish an IC supplement to its annual report (*see Appendix*). Following rigorous collection of metric data, consolidation is achieved in this model by combining all financial indicators into a single monetary value *C,* and converting all the remaining metrics into ratios then aggregating them into an efficiency indicator *I*. The financial value of IC is computed as *I* multiplied by *C*. Since the Navigator was designed specifically for one company, some authors find that it uses metrics that are tailored to fit the insurance industry in particular and thus could not be generalised (Bontis 2001).

IC Index

The IC index aims to provide a complete assessment of IC in a single number (Roos et al. 1998). The process starts with identification of organisational key success factors (KSF) in light of the firm's mission and vision. KSFs are then used by management to develop company-specific IC indicators, where each indicator must take the form of a dimensionless number to enable aggregation. Finally, indicators are assigned weights to reflect their relative importance and their values are combined using the weighted average method into a single figure, the *IC index*. According to the model's creators, changes in the value of the resultant index should follow the same pattern as that of the company's market value. Lack of correlation between market value and IC index would be taken as a sign that indicators and weights have not been properly set. Roos at al. emphasise that selection and weighing of indicators must be based on the organisation's strategy, characteristics and market conditions. Although the flexibility of this method allows it to be implemented in a wide range of organisations, the lack of standardised measures does not allow companies to benchmark their IC indices because each index is based on a unique set of criteria.

Technology Broker (IC Audit)

The Technology Broker provides a methodology for conducting an in-depth audit of organisational IC (Brooking 1996). The audit begins with a survey to assess four IC dimensions: *market assets*, *human-centred assets*, *intellectual property assets* and *infrastructure assets*. A variety of data collection tools are employed within the audit, including interviews, questionnaires and market research, in addition to numerical and financial data analysis. Based on the audit, each aspect is compared with the optimal state and is given an index score from one to five, five being the optimum value. Results are then repre-

sented visually on a concentric pie chart to depict the score, importance and trend of each dimension. The final step is the financial valuation of IC for which the audit relies on HRA models.

Intangible Asset Monitor (IAM)

The IAM is a framework that offers a tool for internal measurement intended for providing management with information about IC for strategic decision-making (Sveiby 1997). It is not aimed at the external presentation of the company's IC to its stakeholders. The model divides IC into three components—*internal structure*, *external structure* and *human competence*—and proposes indices to measure each component from three different perspectives: *growth/renewal*, *efficiency* and *stability*. The output shows the organisation's strengths and weaknesses and is displayed in a tabular format. Although IAM is an effective internal reporting tool, it does not provide any quantitative figures, which can be considered as a drawback.

IC Rating

The IC Rating is based on the Skandia Navigator, but adds '*Business Recipe*' to the three classic components of IC to reflect the company's strategy and surrounding environment (Jacobsen et al. 2005). Similar to the IAM, IC is assessed from the perspectives of *Effectiveness*, *Risk* and *Renewal* by evaluating more than 200 parameters through in-depth interviews with the organisation's internal and external stakeholders. Results are documented using a letter grading system where 'AAA' is the best grade and 'D' is the worst. They are presented to executive and operational members in a format that encompasses the information needed by each level. There are no further steps in this method; parameter ratings are not consolidated and no dollar value for IC is computed. Since the same questions are used in all organisations, the IC Rating is considered relatively generic. However, it makes it less adaptable to specific organisations' conditions when alterations to the questions are required.

The Value Chain Scoreboard

The Value Chain Scoreboard (also known as *Value Chain Blueprint*) was developed to provide management and shareholders with relevant information about the company's value chain (i.e., business model) in order to make better strategic decisions (Lev 2001). The chain is conceptualised as a three-phase

Table 9.1 The value chain scoreboard

Discovery and Learning	Implementation	Commercialisation
1. **Internal renewal** Research and Development Workforce training and development Organisational capital, processes	4. **Intellectual property** Patents, trademarks and copyright Licensing agreements Coded know-how	7. **Customers** Marketing alliances Brand values Customer churn and value Online sales
2. **Acquired capabilities** Technology purchase Spillover utilisation Capital expenditures	5. **Technological feasibility** Clinical tests, food and drug administration Beta tests, working pilots First mover	8. **Performance** Revenues, earnings and market share Innovation revenues Patent and know-how royalties Intangible-based earnings
3. **Networking** Research and development alliances and joint ventures Supplier/customer integration Communities of practice	6. **Internet** Threshold traffic Online purchase Major internet alliances	9. **Growth prospect** Product pipeline dates Expected efficiency savings Planned initiatives Expected breakeven and cash burn rate

process of innovation which begins with *discovery and learning*, followed by *implementation*, and ending in *commercialisation* of new products and services. The model suggests three categories of indicators for each of the three phases of the innovation value chain, as shown in Table 9.1. According to Lev, scoreboard indicators should be (1) quantitative, (2) standardised to allow inter-firm comparison and (3) their validity should be confirmed by empirical evidence, such as statistical correlation between the indicators and corporate market value. Among the strengths of this framework are its clarity, focus on innovation and effort to link intangible value to financial value. Its structure, however, may not be applicable to all types of organisations.

Intellectual Capital Statements

The Intellectual Capital Statements framework is designed by Mouritsen et al. (2001) and his team to support the Agency for Trade and Industry in IC measurement of Danish firms. It does not divide IC into components but rather adopts a holistic view of organisational knowledge. Furthermore, unlike other efforts, it attempts to prescribe an agenda of corrective action to management. They propose the use of *knowledge narratives*, which they define as 'a plot about a certain phenomenon that shows the sequence of a set of events,

dramatises the linkage between them, and points out the good things and the bad elements that have to be avoided to make the point of the narrative succeed' (Mouritsen et al. 2002). Narratives are a textual description of the firm's KM strategy based on its objectives and available resources. They are used to define a list of associated management challenges which the firm would have to overcome to be able to achieve the purpose of the narrative. The progress of putting knowledge narratives into action is monitored through a set of indicators referred to as the *Intellectual Capital Accounting System*. The complete IC statement takes the form of a combination of narratives, indicators and sketches that visualise the relationship between them. By using descriptive accounts, IC statements add an interesting qualitative and goal-orientated aspect to IC measurement; however, narratives risk being biased toward the view of those who write them.

Human Capital Hierarchy of Measures (HCHM)

The HCHM is based on an HC case study conducted by the Civil Aviation Authority (CAA) in the UK (Dilys 2009). CAA adopted a definition of HC measurement as 'measuring the value created by our people, policies, and practices' and created an HC measurement framework to address these three aspects. The resulting measures were arranged in hierarchal form based on four perspectives of HC: *workforce data* (e.g., headcount), *operational data* (e.g., cost per hire), *outcome measures* (e.g., Turnover rate) and *performance measures*, which focus on the link between data and strategic performance (Dilys 2009).

Human Capital Monitor (HCM)

The HCM model is introduced as a means of recognising the vital 'contribution of people to value creation' (Mayo 2001). It is based on the following equations:

$$\textbf{Human Asset Worth} + \textbf{People Motivation and Commitment} = \textbf{People Contribution to Added Value}$$

$$\textbf{Human Asset Worth} = \textbf{Employment Costs}\left(\textbf{EC}\right) \times \textbf{Individual Asset Multiplier} / 1000$$

EC is the sum of base salary, value of benefits and employer taxes. The individual asset multiplier is a weighted average assessment of an employee's capability, potential, contribution and values alignment. Five factors are assessed through a mix of metrics and surveys to measure motivation and commitment: *leadership effectiveness*, *practical support*, *nature of the workgroup, culture of learning and development* and *systems for rewards and recognition*. Contribution to added value is measured though a set of financial and non-financial metrics.

The Performance Approach

Although numerous models attempt to measure organisational knowledge, a number of authors believe that knowledge cannot be measured due to its complex and intangible nature. Instead, they attempt to measure the *effects* of knowledge which are, in most cases, more palpable than knowledge itself. There is a widely discussed correlation linking knowledge and its management to enhanced performance. However, such link is rarely quantified, which makes it difficult for managers to acknowledge the real contribution of KM to their companies (Wu and Chen 2014). Accordingly, the third measurement approach focuses on evaluating the impact of knowledge and KM on organisational performance.

Models of this type measure the performance of KM *processes* or that of their *outcomes* (Goldoni and Oliveira 2010). Process performance measures adopt leading indicators which monitor the performance of KM in real time and allow management to make corrective interventions as KM projects are being executed. Examples of process metrics include statistics on the usage of electronic knowledge management systems. Although such measures are useful in providing information about the engagement of employees with KM initiatives, they are more oriented towards information technology and are not sufficient in establishing a clear link between KM and corporate performance (Khalifa et al. 2008). Output measures, on the other hand, rely mainly on retrospective indicators to demonstrate the results of KM initiatives after their completion. Their premise is the comparison of performance before and after KM implementation in order to examine its impact on firm performance. An array of performance management (PM) methods are used to assess post-knowledge-management performance. These include:

- *Financial Performance Measures*—Quantitative financial indicators such as stock price, profitability or return on investment from data taken from

financial statements and annual reports. For example, Petra and Annelies (2012) used the financial data of 705 Belgian firms to demonstrate that KM has an 'indirect positive impact' on financial performance that exceeds the costs associated with KM in the long term.

- *Operational Performance Measures*—Non-financial measures, such as reductions in cycle time or drop in number of complaints.
- *Survey-Based Methods*—Relying on qualitative opinion-based surveys. KM performance is evaluated based on respondents' views and perceptions of the improvements KM has made to their organisations.

Knowledge Measures Classification

In light of the previous review, knowledge measures can be summarised in five dimensions referred to as the *Knowledge Assessment Pentagon (KAP)* shown in Fig. 9.1 (Ragab and Arisha 2017).

The KAP framework classifies metrics and indicators used to measure knowledge using a fivefold taxonomy composed of:

1. *Scope*—Refers to the level of assessment. Measures could be developed to assess knowledge at the national, organisational, or individual level.

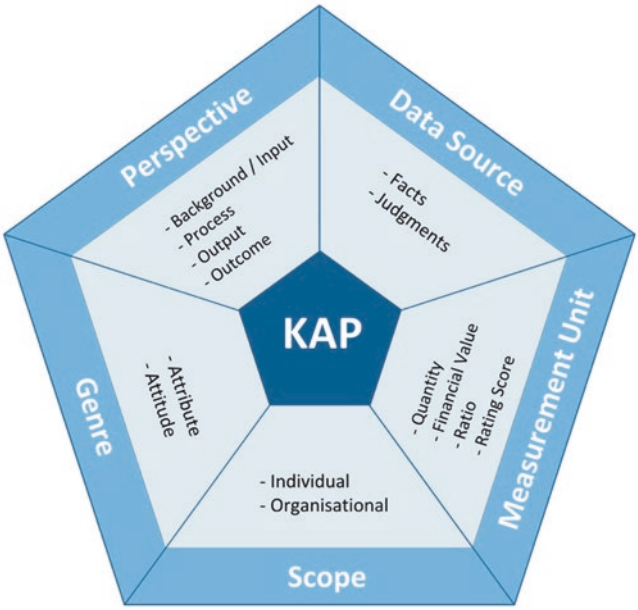

Fig. 9.1 Knowledge assessment pentagon measures classification

2. *Data Source*—Data collected for knowledge measurement may be based on concrete verifiable and factual evidence or alternatively can rely on assessor's judgement (Mitchell and Boyle 2010).
3. *Measurement Unit*—Units used for measurement can be in the form of counts (quantities), monetary values or ratios. When measuring qualitative factors, rating scales are used and scores are assigned by an assessor.
4. *Genre*—This dimension distinguishes between measures that assess *attributes,* such as years of experience, and those that measure *attitudes* towards a certain action or towards the organisation. A common example of the latter is ratings of employee motivation and engagement in knowledge-sharing.
5. *Perspective*—Perspectives denotes the time orientation of metric. They can be prospective, retrospective or concurrent and so include:

    - *Background measures*—Assess inputs that which empower the creation and exploitation of knowledge. Example measures include education levels and infrastructural resources. Such measures are based on the assumption that there is a link between these factors and the knowledge stocks of an individual, company or country (Malhotra 2003).
    - *Process measures*—Indirect indicators of knowledge flows resulting from engagement in knowledge processes. They tend to capture dynamic rather than static attributes, such as contribution and usage frequency of knowledge bases, or rates of social interaction (Mitchell and Boyle 2010).
    - *Output measures*—Evaluate the end results of knowledge processes. The assumption is that knowledge manifests itself in individuals or in 'organisational knowledge items', such as best-practice manuals and registered patents (Bolisani and Oltramari 2012).
    - *Outcome measures*—While KM outputs are the product of knowledge processes, KM outcomes are measures of the impact of such outputs on organisational performance. Typical measures that fall into this class are increases in revenue or achievement of targets (Malhotra 2003).

Individual Knowledge Assessment

Review of previous studies indicates that knowledge measurement models mostly adopt a holistic view of the firm and attempt to measure knowledge on the firm level using the notion of IC. There is a tendency in KM research to embrace an organisational view of knowledge, often overlooking its individ-

ual roots. This has prompted recent studies to advocate the need for the integration of an individual perspective in KM research (Rechberg and Syed 2014). Accordingly, no significant efforts are directed towards evaluating individuals from a knowledge-based perspective. Existing individual knowledge measures are only designed as part of a wider framework aimed to establish an overall evaluation of IC, and so the focus is more on the organisation than on the individual. The need for individual knowledge assessment grows from the pivotal role played by individuals within the organisational knowledge environment, a role that remains unaddressed by previous measurement models.

Drivers for Individual Knowledge Assessment

The knowledge-based view envisages the firm as an ever-changing system of organisational knowledge production and application (Spender 1996). The nature of this system is multifaceted and comprises complex interactions between individual knowledge held in people's minds and organisational knowledge embedded in systems, culture and practices (Jakubik 2007). Within this evolving intra-firm dynamic, individuals play a momentous role. Initially, knowledge is created solely by individuals based on their unique abilities to add meaning to information, identify patterns and draw conclusions from experiences within different contexts. This knowledge, however, is mostly tacit and non-transferable unless individuals actively and willingly engage in knowledge codification and sharing. Only through the contribution of individuals in explicating and transferring knowledge does knowledge become institutionalised within the firm. Among individuals, knowledge-sharing occurs during social interaction between employees which leverages best practices to avoid reinventing the wheel (Connelly et al. 2014). When seeking to utilise knowledge, organisations rely on the exclusive human ability to act upon prior knowledge and facilitate its integration into decision-making to drive organisational performance (Grant 1996). It could, therefore, be concluded that individual employees are the common denominator in most aspects of an organisation's knowledge ecosystem and the most significant component of knowledge work. Individuals are key actors in the development of IC due to their ability to create, acquire and codify knowledge. They are the primary knowers of a firm's knowledge and the sole executors of fundamental knowledge processes within the firm, namely creation, codification, sharing and application.

Deeming that individuals are at the centre of the firm's knowledge system suggests that one of the pillars of an effective KM strategy lies in the efficient management of individuals as knowledge resources. Individual knowledge

assessment is an integral part of such strategy that empowers the firm to locate knowledge assets, thereby improving its ability to protect its human capital. If not addressed, the loss of knowledge causes severe disruption to KM and could results in significant decline in productivity and profitability (Daghfous et al. 2013). Mitigating the risk of knowledge loss ultimately begins through a systematic method, which enables the recognition of knowledge holders within the organisation. This empowers managers to take precautionary measures through the formulation of well-defined retention strategies. Assessment outcomes also support managers in making decisions regarding the optimal allocation of their human capital, or in other words *putting the right person in the right place*. Other benefits of knowledge assessment include discerning individuals' contributions to value creation, evaluation of the impact of KM initiatives, formulation of knowledge-based training and development programmes, integration of knowledge dimensions into a company's compensation and reward systems, and providing knowledge-based insights to support recruitment, outsourcing and downsizing decisions (Fig. 9.2).

Current Practices of Individual Assessment

While individual knowledge assessment is hardly present in today's organisations, individual assessment, on the other hand, is a highly prevalent practice. To support recruitment and reward processes, assessment commonly takes the

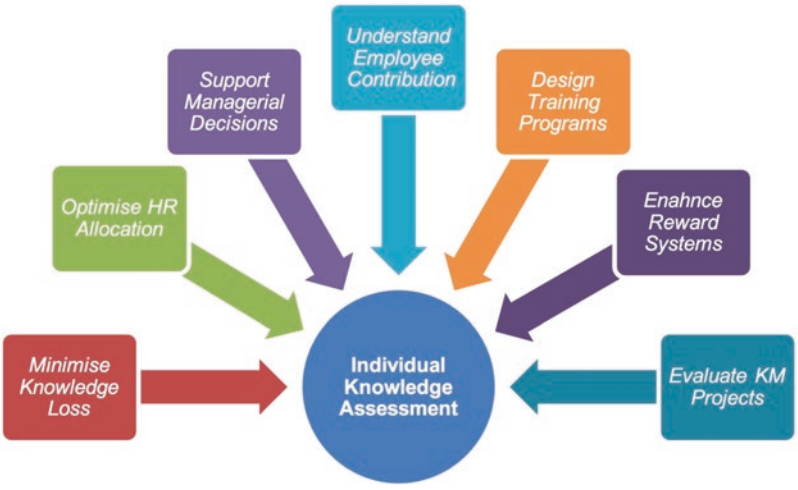

Fig. 9.2 Drivers of individual knowledge assessment

form of *performance appraisals* and/or *personality tests*. A performance appraisal is a periodic evaluation of an individual's job performance using certain criteria (Fletcher 1997). It involves the completion of standard forms by the line manager, sometimes followed by one-to-one feedback meetings. Appraisal criteria are mostly firm specific and have to be designed in a tailored fashion to fit the characteristics of the job and the company. Individuals are evaluated based on their competences and what they have accomplished over a certain period of time. Comparably, personality testing has its roots in psychology and is also widely used in human resources management (Torrington et al. 2011). Such tests are employed to identify the psychological traits of an individual, often through self-administered questionnaires in order to evaluate their potential suitability for a job (Lussier and Hendon 2012). Examples of popular models applied in psychometric testing include the *Big Five Personality Test* and the *Myers-Briggs Type Indicator*. Individual knowledge assessment differs from the previous two approaches in that it places the knowledge held by employees at the core of the evaluation process. In simpler terms, performance appraisal measures *what they do* and personality tests identify *what they are*, while knowledge assessment focuses on *what they know*. The characteristics of the three perspectives are contrasted in Table 9.2.

Exploratory Study: Practitioners' View on Individual Knowledge Indicators

The first step towards the assessment of individual knowledge entails the identification of its underpinning factors, which constitute the foundation of an assessment model. A recent study conducted by the authors to serve this pur-

Table 9.2 Characteristics of individual knowledge assessment

	Performance appraisal	Personality tests	Knowledge assessment
Purposes	Performance Improvement, reward systems	Recruitment, Team building	Identification, allocation and development of knowledge resources
Focus	Results-based *'What One Does'*	Personality-based *'What One Is'*	Knowledge-based *'What One Knows'*
Assessment Parameters	Company specific	Mostly standard tests	Generic or firm specific
Methodology	Direct manager evaluates employee according to predefined criteria	Self-administered questionnaire	May include both

pose sought to explore indicators of individual knowledge from a practitioners' perspective. The aim of this study is to investigate the factors managers incorporate when they evaluate individual knowledge and the main characteristics associated with individuals who are considered *knowledge holders*. To achieve this aim, interviews were held with a number of senior managers from different industrial sectors. Through the findings of the study, managers identified four dimensions of individual knowledge, each influenced by few important factors, as follows.

Learning

The notion of learning is identified as an overarching theme in individual knowledge. Managers describe learning as being either *formal* or *experiential*, referring to the sources of learning as '*qualifications and experience*' or '*learning from previous success and failure*'. Knowledge and learning are two strongly linked concepts and are often regarded as two sides of the same coin. Learning is commonly described as a knowledge acquisition process, while knowledge is sometimes defined as the outcome of a learning process through experience or study (Kogut and Zander 1996). In his renowned book, Michael Polanyi (1967) states that knowledge is developed by '*indwelling*', which he describes as the assimilation of knowledge by living through an experience. Nonaka (1991) refers to this process as 'internalisation', which he describes as *learning-by-doing*. Learning also takes place in structured study environments, such as academic institutions and personal development courses. Therefore, experience, education and training were cited as the principal factors that contribute to learning and, ultimately, individual knowledge. This explains why they are frequently used as the main criteria for candidate selection in HR recruitment processes.

Social Interactions

Socialisation within the workplace is viewed as a key driver of knowledge creation and sharing. According to social learning theory, learning is a social activity that emerges from interactions between individuals to achieve a shared understanding of an idea or a concept (Wenger 1999). Consequently, knowledge is constructed by individuals who participate in social processes and assimilate their outcomes (Spender 2006). Participants assume the interchangeable roles of *knowledge-providers* and *knowledge-seekers* through a dynamic process that occurs in both formal and informal settings (Jakubik 2011).

Socialisation can also result in new knowledge being created when a person obtains a new insight triggered by interacting with another. This is reflected by the ability of employees to be more innovative when they are part of a team than when they work individually. Managers point to three main factors that they believe contribute to the effectiveness of social interaction in nurturing knowledge creation and sharing:

- *Social Ties*
  Research on organisational social networks reveals that when seeking knowledge, employees rely upon their chain of relationships and request help from people they know in the same setting or in other companies (Hansen 1999). In such cases, their ability to acquire the knowledge necessary to overcome challenges becomes highly dependent upon the network structure and tie strength—in other words, *knowing whom to talk to when looking for answers*.
- *Communication*
- Research also acknowledges the significant role of face-to-face and technology-mediated communication in enhancing knowledge-sharing among organisational members and its ultimate impact on organisational performance (Vorakulpipat and Rezgui 2008). As Davenport and Prusak (1998) state: *"In a knowledge-driven economy, talk is real work."*
- *Willingness to Share*
  Given that *knowledge is power*, and that sharing is a voluntary process, individuals are not likely to share their knowledge unless they are personally motivated to do so. For this reason, the vast majority of managers believe that the value that a company derives from an individual's knowledge hinges upon their attitude towards sharing their expertise with others. The contribution of knowledge workers to the firm's knowledge dynamic originates from a personal drive to engage in knowledge-sharing and codification processes. Pertinent research exploring antecedents of knowledge-sharing unveils a number of motivational factors that influence knowledge-sharing behaviour among employees. The most prominent factors identified include:
  (1) recognition and reward
  (2) empowerment
  (3) reputation building
  (4) trust
  (5) corporate culture
  (6) leadership support
  (7) IT infrastructure. (Evans 2012)

Capability

Findings also indicate that performance appraisal is currently the most commonly used method to assess individual knowledge. In most companies, the best performers are regarded as the most knowledgeable. The fact that performance appraisal is taken as a proxy measure of knowledge suggests a perceived correlation between individual knowledge and individual performance based on notion of *measuring knowledge through its effects*. The relationship between knowledge and capability is deeply rooted in KM theory and evolves from the ability of knowledge to empower effective action (Senge et al. 1999; Zeleny 2002). Innovative capability is also highlighted as another key outcome of holding knowledge. Innovation is the generation, development and implementation of new ideas to create value for business. It is traditionally conceptualised as a process of accumulation and recombination of knowledge (Darroch 2005). Innovation emerges as one of the main outcomes of individual knowledge in organisations, and knowledge is envisaged as a prerequisite for generating new ideas. Du Plessis (2007) describes innovation as the use of existing knowledge to create new knowledge. Knowledge is thus an antecedent of innovation and a core component of innovative capability (von Krogh et al. 2000).

Procedure

Equally important is the *process* aspect of individual knowledge, which comprises the mode of operation—or *know-how*—of both formal and informal work practices and procedures. Knowledge holders are believed to have deep understanding of business activities and equally an ability to improve process capabilities, a dimension referred to as *procedural knowledge* (Singley 1989). Procedural knowledge is the knowledge of business processes and best practices adopted in a firm to do the required tasks (Guzman 2009). According to Davenport and Prusak (1998), the interaction with business processes requires knowledge of *how* and *why* they are used to execute business operations. Such interaction increases employees' understanding of the work's dynamics and enhances their knowledge of the business.

The aforementioned findings are summarised in the *IK*^{4} *Model* (Fig. 9.3). This model depicts the four dimensions of individual knowledge discerned from the study and their underlying influencing factors.

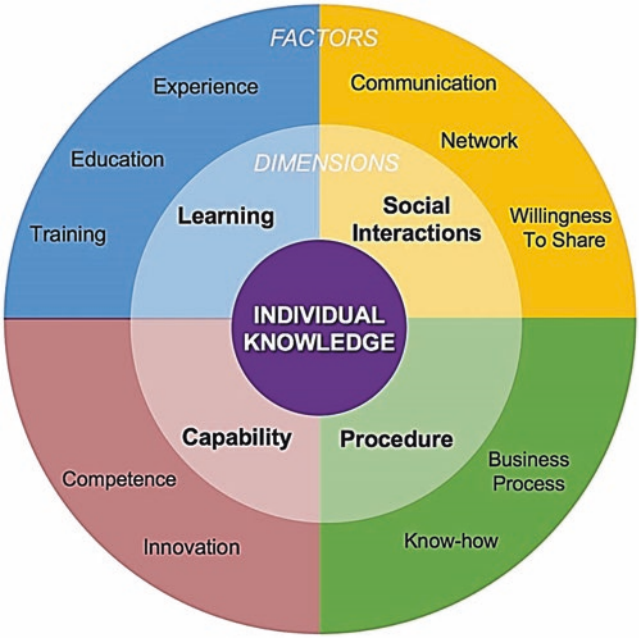

Fig. 9.3 IK[4] individual knowledge model

Conclusion

Global competition in the current knowledge economy has created an urgent demand for thorough understanding of organisational knowledge dynamics in order to maximise value creation and achieve competitive advantage. Knowledge assessment empowers an organisation to locate knowledge stocks and visualise knowledge flows, thus enhancing its knowledge management capabilities. To this end, a wide variety of models have attempted to address intellectual capital measurement, adopting different approaches in quantifying a seemingly unmeasurable phenomenon. Individual knowledge assessment is an equally vital endeavour to ensure knowledge retention and effective human capital planning; yet, it remains relatively unexploited. The operationalisation of employee knowledge assessment requires the identification of factors that contribute to knowledge accumulation, in addition to the effects of knowledge on individual aptitudes. This study in this chapter presented an analysis of the conceptualisation of individual knowledge from the perspective of managers who identify key attributes of knowledge holders. The study's findings can contribute to both KM theory and practice. It proposes a framework that elucidates various aspects

of individual knowledge based on a practitioners' view and supported by extant KM literature, thus setting a foundation for important research. On the practice side, the study indicates a number of factors that can contribute to the acquisition of individual knowledge and hence support organisational initiatives to enrich individuals' knowledge. Examples include training programmes, networking events and so forth. Individual assessment metrics can also be used to benchmark the knowledge of employees for appraisal purposes.

Acknowledgement The authors would like to thank Miss Jenni Floody for her contribution to this chapter. Special thanks to Pharos University in Alexandria, Egypt, for its support of this research.

Appendix

Skandia Navigator Intellectual Capital Metrics (Edvinsson and Malone 1997)

Customer Focus

- Annual sales/customer
- Average customer size
- Average duration of customer relationship
- Average time from customer contact to sales response
- Customer rating
- Customer visits to the company and the number of customer hits to the company website
- Customers IT literacy
- Customers lost
- Customers/employees
- Days spent visiting customers
- IT investment per sales person (and perhaps dollars used in advertisement and their effectiveness)
- IT investment/service and support employee
- IT literacy of customers
- Market share
- Number of contracts/IT employees
- Number of customers
- Number of external IT customers
- Number of internal IT customers
- Points of sale
- Rate of repeat customers

- Ratio of sales contact to sales closed
- Revenue generating staff
- Satisfied customer index, e.g. customer contact/support/service through electronic means, number of items of merchandise returned, number of refunds made, etc.
- Service expense/customer/contact
- Service expense/customer/year
- Support expense/customer
- Telephone electronic accessibility

Process Focus

- Administrative expense/employee
- Administrative expense/gross premium
- Administrative expense/managed assets
- Administrative expense/total revenues
- Change in IT inventory
- Contracts filed without error
- Contracts/employee
- Contribution of IT inventory less than two years old to quality goal
- Corporate performance/quality goal
- Corporate quality performance, e.g. ISO 9000
- Cost of administrative error/management revenues
- Cost of IT inventory less than two years old/increase in profits
- Cost of IT inventory less than two years old/increase in revenues
- Discontinued IT inventory/IT inventory
- Employees working at home/total employees
- Function points/employee month
- IT capacity (Central Processing Unit and Direct-Access Storage Device)
- IT capacity/employee
- IT expense/administrative expense
- IT expense/employee
- IT performance per employee
- Network capability/employee
- Orphan IT inventory/IT inventory
- PCs and laptops/employee
- Processing time, out payments
- Replacement cost of IT inventory (including incompatible software) discontinued by manufacturers

- Total yield compared with index
- Value of IT inventory discontinued by manufacturers

Renewal and Development Focus

- Average age of company patents
- Average contacts by customer/year
- Average customer age; education; income
- Average customer duration with company in months
- Average customer purchases/year
- Business development expense/administrative expense
- Capacity of EDI systems
- Capacity upgrades
- Common training programs of company and partners
- Company historic rate of new products reaching market
- Company products (or components) designed by partners
- Competence development expense/employee
- Contribution of corporate communications network to corporate revenues
- Contribution of engineering design system to corporate revenues
- Contribution of MIS to corporate revenues
- Contribution of process control system to corporate revenues
- Customer opportunity base captured
- Direct communications to customer/year
- Educational investment/customer
- Investment in competitive intelligence programs
- Investment in new customer service/support/training programs
- Investment in new product support and training
- Investment in strategic partner development
- IT development expense/IT expense
- IT expenses on training/IT expense
- Marketing expense/product line
- New markets development investments
- New products currently in development
- Non-product-related expense/customer/year
- Number of company patents
- Opportunity share
- Patents pending/software/data/databases developed
- Percentage of customer training, service and support provided by partners
- R&D expense/administrative expense

- R&D invested in applications
- R&D invested in basic research
- R&D invested in product design
- R&D resources/total resources
- Ratio of new products (less than two years) to full company product family
- Relationship investment/customer
- Satisfied employee index
- Share of 'method and technology' hours (%)
- Share of development hours
- Share of employees under age 40
- Share of training hours
- Structural capital development investment
- Training expense/administrative expense
- Training expense/employee
- Upgrade of Electronic Data Interchange systems
- Value of company's engineering design system
- Value of company's management information system
- Value of corporate communications network
- Value of corporate sales engineering system
- Value of EDI systems
- Value of Process control system

Human Focus

- Annual turnover of full-time permanent employees
- Assigned to full-time employees who spend less than 50 percent of work hours at a corporate facility
- Assigned to part-time employees and non-full-time contractors
- Average age of full-time permanent employees
- Average years of service with company
- Average years with company of full-time permanent employees
- Company managers with advanced degrees: Business, science, engineering, liberal arts, etc.
- Employee turnover
- Empowerment index
- Full-time or permanent employees who spend 50 percent of work hours at a corporate facility
- IT literacy of staff

- Leadership index
- Managers assigned to full-time permanent employees
- Motivation index
- Number of employees/employee shares of the company (percent shares owned by employees, program for employees to buy company shares, etc.)
- Number of female managers
- Number of full-time permanent employees
- Number of full-time temporary employees, average years with company of full-time temporary employees
- Number of managers
- Number of part-time employees or non-full-time contractors, average duration of contract
- Per capita annual cost of training, communication, and support programs for full-time permanent employees
- Per capita annual cost of training, communication, and support programs for full-time temporary employees
- Per capita annual cost of training, communication, and support programs for part-time employees and non-full-time contractors
- Percentage of company managers of different nationality than the company registry
- Time in training (Days/Year)

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10

Knowledge Management and Communities of Practice: Supporting Successful Knowledge Transfer

Deborah Blackman

Introduction

Much has been written about communities of practice (see, for example, Duguid 2005; Hughes et al. 2007; Lave and Wenger 1991, 2006; Wenger 1998, 2010; Wenger et al. 2002) and how they support the growth of learning (Bailey 2013; Brown and Duguid 1991). However, it has also been established that creating sustainable communities that are institutionalised within organisations can be challenging (Kerno 2008; Roberts 2006; Storberg-Walker 2008) and many communities fail to deliver on their promise (Probst and Borzillo 2008). In this chapter, I present the case of a particular community of practice (CoP) that was initially emergent by itself and then organisationally supported. What is of interest to knowledge management scholars is how the community was supported in ways that enabled it to remain a true community of practice, while creating real value for both the organisation as a whole as well as the members of the community. Initially, the reasons for developing ways to manage knowledge transfer are outlined. Next, the possibilities for supporting knowledge transfer through creating and supporting CoPs are presented, highlighting their potential for both new knowledge creation as well as the movement of such knowledge. The case study is then presented, and from this the lessons learnt are developed and implications are drawn.

D. Blackman (✉)
School of Business, UNSW Canberra, Canberra, Australia

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Why Knowledge Transfer Systems Matter

The importance of knowledge in the long-term success of organisations has been widely discussed for many years (see, for example, Goh 2002; Lyles 2014; Nonaka 1994; Tsoukas and Vladimirou 2001). It has been considered to be not only a source of competitive advantage in terms of creating new products, services and value (Argote and Ingram 2000; Venkitachalam and Willmott 2015) but also as a way of supporting continuous improvement (Barber et al. 2006; Yahya and Goh 2002). As a result of its perceived significance, there has been considerable research into how knowledge is created (Nonaka 1994; Nonaka et al. 2006; Probst et al. 2000; Snowden 2000; Tzortzaki and Mihiotis 2014; Yang et al. 2010), stored (Ranjbarfard et al. 2014; Venkitachalam and Willmott 2015), used (Ranjbarfard et al. 2014) and transferred (Argote and Ingram 2000; Venkitachalam and Willmott 2015).

The latter is significant in that for knowledge to have maximum impact it will need to not only exist but then to be shared in ways that enable it be applied to create added value (Argote and Ingram 2000; Dixon 2000; Goh 2002; Sheng et al. 2013). However, sharing knowledge is attended by challenges that have been well documented (Argote 1999; Argote and Ingram 2000; Goh 2002; Ranjbarfard et al. 2014; Szulanski 1996, 2000). One proposition for overcoming some of the problems was the creation of knowledge networks, where knowledge created via practice was shared through social learning: this was the concept of a CoP.

Communities of Practice, Knowledge Creation and Knowledge Transfer

CoPs have been defined as a 'groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis' (Wenger et al. 2002: 4). While this definition has been recognised as being more of a commodification of the concept (Cox 2005), it maintains a focus on the development of ideas through collective learning. In this chapter, I adopt this definition in part because of the analysis by Cox, who suggests that Wenger et al. (2002) see the concept of community as a group 'set up explicitly to allow collective learning and cultivated by management' (2005: 537). The other reason is that in discussing the CoP with the case study group themselves, this was clearly the definition that had the most resonance for them. They saw the CoP as

having a clear purpose that provided benefit for both the members and the organisation by specifically enabling learning and knowledge transfer.

When writing about CoPs, there are four core themes: the domain or area of interest, and how it can add value in the specific context (Bailey 2013; Snyder and Wenger 2010); the development of the community and the impact of the emerging relationships (Bailey 2013; Snyder and Wenger 2010); the way that learning and knowledge are created and transferred (Bailey 2013; Brown and Duguid 1991; Morgan 2011); and how they can be developed or supported through frameworks, implementation tools, case studies and leadership (Bailey 2013; Snyder and Wenger 2010). In this chapter, I intend to consider aspects of all four of these themes when discussing a specific CoP exemplar which challenged perceived evidence that many organisationally supported CoPs are as imposed and lose their usefulness or relevance over time (Burford et al. 2011; Roberts 2006).

That CoPs can lead to knowledge creation and exchange is widely accepted (Breu and Hemingway 2002; Wasko and Faraj 2000; Wenger et al. 2002). The argument is made that if knowledge is created through dynamic interactions between individuals (Cook and Brown 1999; Nonaka and Snowden 2000; Toyama 2015), then a group of individuals who are sharing their practice experiences should be able at least to share knowledge, if not create new ideas (Nicolini et al. 2003). However, what ensures that a CoP is successful is less well established. Two apparently critical factors are a willingness by the individual to be actively involved with the CoP and a desire that participation leads to an intellectual exchange perceived as a benefit (Wasko and Faraj 2000). In this situation, the CoP will form a context that acts as the trigger for individual learning (Wenger 1998). Wenger et al. (2002) argue that such individual learning should be deliberately triggered within the CoP by bringing together multiple experts. Thus, complex learning routines will be instigated which, in turn, lead to the acquisition of new knowledge as a result of the inputs to, and the interactions within, the system.

The implication is that learning will always create benefit; however, Wenger talks of the impact of power-brokering within CoPs. This is where whoever has greater power will be able to be the broker and, therefore, dictate what is and is not prioritised: 'Brokers are able to make new connections across communities of practice, enable co-ordination, and—if they are good brokers—open new possibilities for meaning' (Wenger 1998: 109). Thus, an internal dominant coalition or external senior leadership could determine how knowledge transfer and learning processes are framed, thereby affecting what knowledge inputs or outputs actually occur.

Some of this could be explained by the role of CoPs within organisations. Individuals are socialised into the CoPs that they work within and, therefore, construct what is acceptable to the CoP, which potentially differs from the knowledge the organisation desired to see created and/or shared (Yanow 2004; Wenger 1998). This may be particularly true as regards processes and routines. The desire felt by many to frame their interactions within the CoPs they are compatible with, feel comfortable operating within, or consider to be an appropriate audience, may mean that transfer will take place but will be limited to being only within the community (Kerno 2008). As a CoP may not be an operational unit in the organisational structure, this could prevent transfer to individuals who need the knowledge, or to the organisation itself.

So, the question becomes: What makes a CoP successful in the eyes of *both* the individuals who sit within it and the organisation it sits within? In the rest of this chapter I will present a positive example of a CoP that grew from the bottom up in the Canadian Public Service (CPS). What is of note is how it has been institutionalised, is used for knowledge development and transfer and is now becoming an important source of management knowledge for those outside of the CoP.

Methodology

When designing a methodology for this research I adopted a constructivist perspective, which is concerned with accessing and understanding the meaning and experiences of participants within the phenomena being researched (Moon and Blackman 2014; Schwandt 1998). For constructivists, knowledge that represents an individual's view of the world is created through interactions within their social contexts (Blackman et al. 2005; Cullen 1999); human beings are seen not as passive receivers of information but as active constructors of meaning (Blackman et al. 2005; Fosnot 2005). In this case, I wanted to access the knowledge that participants held as a result of their experiences as members of or communicators with the CoP being studied. An exploratory, qualitative case study was developed in order to gain an in-depth understanding of the particular phenomenon (Eisenhardt 1989; Goulding 2005; Hartley 2004; Stake 2006; Yin 2014). The case study was the CoP called the National Managers' Community. The phenomena to be studied was the participant and organisational perceptions of whether the CoP was successful in terms of creating and transferring knowledge and, if so, what that meant. It was a suitable research design, as analysing a case study is a research strategy that focuses on understanding a particular series of events within a given

context in order to build, extend or clarify theory (Hartley 2004; Yin 2014). Critical to the usefulness of the analysis is the clarity of the case boundary (Perren and Ram 2004; Yin 2014). In this research, the case boundary was around the membership of National Managers' Community as it sits within the wider CPS.

National Managers' Community

The CPS includes all those employed to enact the decisions taken by the Canadian Government through its federal and provincial organisations. As of 31 March 2014, it consisted of 257,138 employees across 94 departments and agencies; of these, 195,330 were employed in what was described as Core Public Administration and 61,808 in Separate Agencies (Government of Canada 2016). At the time of the interviews, there were an estimated 40,000 managers across the service (source: I1).

Data for this chapter came from two sources. The first was secondary data from a project that undertook research into performance management in 2011 (Blackman et al. 2012 and 2013). During that research, international experiences were sought and the research team, while in Ottawa, learnt of the middle management CoP (as it was then described) and talked to members, the 'support' person and the 'advocate'. It was clear that the CoP had grown organically, having been set up in one agency in Ottawa and then spread across organisations. What was apparent was that it had had senior leadership support from within the large originating agency and had maintained that support as it developed. It was organised by the managers for the managers, and was described as filling a management development niche. It was explained by the then network support officer that, because of the range of skills across the CPS, where a skill gap was identified by some managers, there was almost certainly an internal expert somewhere who could be called on rather than bringing in a consultant or trainer. The difficulty was that the expert might not be good at sharing their knowledge and so the role of the support person was to source the expert internally and facilitate the sharing rather than buying in training. This capacity building was seen as the CoP's core feature at that time.

By late 2014, it had been rolled out across Canada and been given the title National Managers' Community. There are six identified regions, each with their own representative, and an overall network secretary, all of whom are seconded for their substantive position. It was considered a core stakeholder within the CPS, not only supporting capability-building in its own right but

acting as an advisor on many management-related activities across the service. The case study of the CoP was designed to be 'instrumental', in that it was designed to provide insights into both when and why a CoP is seen as successful, in terms of knowledge creation and transfer (Stake 2006). Case studies can be developed through a range of different methods chosen to best acquire data that will enable examination of the theory within that context (Hartley 2004; Yin 2014). Two forms of qualitative interview were used to develop the data for this case: semi-structured individual and group (Creswell 2014; Patton 1990). Participants' perspectives of the CoP were elicited in order to gather their stories and reflections on the phenomenon (Hopf 2004). Initially, interviewees were purposively recruited (Barbour 2001; Ritchie et al. 2014) because either they had been interviewed on related topics in 2012 or they were now holding the positions that had been interviewed previously (i.e., the advocate). From this, a snowball sampling frame was adopted (Noy 2008) to reach more of the key people related to the maintenance of or liaison with the CoP. In total, 18 participants were interviewed. Table 10.1 gives more details. By interviewing network members, those working with the network and those supporting the network, we were able to develop narratives reflecting both what was actually happening on the ground within the CoP, what were the aspirations for the network (Wenger et al. 2011), as well as the broader CPS perception of the network.

The interview protocol was designed around two related issues. The first was that in 2012 the CPS commission had been planning to create formal management development programmes. This was of note because at that time the CoP

Table 10.1 Table of participants

Role of participant	Identifier
Management development programme developer	I1
Senior manager responsible for a new performance management roll-out with a focus on capability development	I2
Middle manager responsible for the new performance management roll-out with a focus on capability development	I3
Senior manager supporting the development of leadership capability across a large part of the CPS	I4
National Managers' Community secretary	I5
National Managers' Community advocate	I6
Group interview (three people) with the performance management implementation team	G1
Group interview (six people) with core members of the National Managers' Community	G2
Group Interview (three people) with the management development implementation team	G3

was seen to fill a gap in terms of middle manager development. The researcher wanted to see what had developed in terms of formal development and whether this had affected the role of the CoP. The second issue was to see how the growth and formalisation of the CoP that had been observed in 2012 had impacted it over time. The data gained from the interview were entered into the qualitative data analysis package NVIVO and the first analysis was undertaken using open coding (Elo and Kyngäs 2008). From this, a general inductive approach was adopted where core meanings in the text were identified, themes and categories developed and a description of the most important themes elaborated (Thomas 2006). This analysis of the data revealed three distinctive themes in terms of why the participants thought that the community remained successful both in terms of its ongoing membership and its capacity to create and transfer knowledge: (1) recognition of value adding by both the members and the CPS; (2) the role of the support personnel; and (3) championship, not management. Each of these will now be considered in turn.

Recognition of Value Adding

Reflecting the work done by Wenger et al. (2002) and Wenger et al. (2011), the CoP was seen to be successful because it was recognised as adding value for both its members and the CPS.

Value for Members

Two different ways were suggested as to how the Network Managers' Community was seen to add value for its members. The first was providing a platform that showcased new or good practices, thereby enabling middle managers to either acquire new knowledge or share the knowledge that they already had. The concept of 'identifying our own experts' (G2) had gained momentum, with access to so many employees with such varied skill sets. This reflected the perspective of learning being a central function of a CoP (Cox 2005; Green et al. 2016; Lave and Wenger 1991), whereby the managers felt themselves to be able to learn because of the interactions that they had as a result of the CoP. The network mantra was that 'engagement plus capacity leads to greater excellence which leads to greater service' (G2). This was achieved through encouraging managers to join with a local network so that it was both a learning and a social relationship (Bertram et al. 2016; Wenger 1998) that developed. This offered immediate value through helping members

with specific issues, providing networking opportunities and potential value through the ongoing development of knowledge capital (Wenger et al. 2011).

The second way that members saw that the CoP as successful was that it offered a context for their voice to be heard. In 2012, we had heard how the CoP was able to create opportunities for members to meet with the senior team. Initially designed to provide a way for employees to learn about organisational initiatives, this had developed in the intervening two years into a two-way system of communication where the Network Managers' Community would be asked for its views on any new human resources or management initiatives. An example of this was the new performance management framework that was about to be rolled out across the CPS. Interviews with key personnel involved in the development and implementation of the initiative (I2, I3 and G1) showed that they saw the CoP as a way both to gain useful feedback on ideas and to think about who their target market was when designing things for managers: 'So we usually get the big players, and then we get certain stakeholder groups there like National Managers Community or small agency groups, things like that […]. The mid-year review guide is the most recent product that we've developed, and I think we really did develop it with the middle managers in mind, so how do you talk to employees, how do you raise issues, how do you articulate them' (G1). Network members saw this as advantageous since, with the dispersed nature of the community, it is easy to develop a top-down approach to developing new initiatives. The advantage of the CoP was it offered a way to 'co-design, [clarify] the need for [the new idea] and assess the capacity for it' (I4). This interviewee stressed 'the importance of recognising that leadership is different in different contexts, the importance of research being practice-based as well as theoretical, and its role in long-term capacity building and the importance of trying to work out what is meant by capacity for the country, for the organisations and then the individuals' (I4). The CoP was the mechanism that I4 saw as ensuring that these forms of conversation took place across the CPS.

Value for the CPS

One potential value for the CPS has been indicated above: the ability to use the CoP as representative stakeholder. It sits on the cusp of formal and informal, with its membership working across organisational boundaries set by departments or agencies, but it is formally recognised in that it has staff seconded to it (Cox 2005). One of the respondents was involved in developing a new management development programme to be rolled out across the

CPS. He suggested that the National Managers' Community helped by both vetting ideas and in that 'they play[ed] a really important role in terms of understanding what managers are facing on a day-to-day basis and feeding that back into the system, and helping people find solutions' (I1). He explained that they were a highly active group pressing for change and improvement; they were "looking for things, they're looking for solutions, looking for help on things' (I1). This role fits with Probst and Borzillo's (2008) suggestion that CoPs could provide a valuable opportunity to express and test ideas in a more informal and potentially risk-free environment.

Another benefit is that the CoP can increase the chances of real changes in practice and performance improvement (Wenger et al. 2011). Developing knowledge capital at the individual level is useful, but the CoP in its current form was seen to be enabling more open discussion of new ideas and initiatives—both top down and bottom up—thus reducing some of the power dependency issues (Cox 2005; Wenger et al. 2002; Zwolski 2016). Moreover, the network creates more open communication and feedback, as the network members both trust the CoP and believe that it will be heard: '[G]overnment often does surveys around what middle managers want and are fortunate if they get a 5% return, but we go out and talk to everybody, so if we do a survey we can about 80% […] but also get a lot more qualitative data so we can give real feedback both ways' (G2).

A third area where the CoP was still adding value was as one element of the management development programme. The original 2011 aim of providing managers with new knowledge has been maintained and so the network is seen to both provide new knowledge for the management cohorts within the CPS but also to be able to indicate what other areas and forms of development would be beneficial to the CPS at the given time. It was suggested that because so much operational knowledge was shared through the CoP, the learning and development teams could concentrate on the more complex skills-building offerings.

Role of the Network Support Personnel

From the findings in the previous section it can be seen that the network's personnel are critical to its operation, such that it was argued that one of the key reasons for its continuing success was the ongoing development of network support personnel. As indicated above, the government provides considerable support in the form of seconding seven people to support the network which, with 70 % of employees in regional areas, was seen as critical for

realising sustainable added value. The context at the time was a phase of major downsizing, and so management capability development was a priority as managers needed to be more able to lead and support their teams, rather than just be technically competent (I2, I5). This then led to seeing that although providing a platform for developing skills for middle managers was still core business for the Network Managers' Community, how that was happening was changing. The original role of providing a forum where good practice and new ideas could be shared and developed still existed but those in the CoP were increasingly seeing their role as supporting knowledge creation: '[W]e want to be able to support the building of effective practitioners' (G2). As well as offering a space for members to come together, increasingly the CoP personnel are identifying skills gaps in their areas and then providing workshops to address these. However, they argue that it is still a CoP in that, although they organise the workshops, they also ensure that any such initiative is tailored for the specific community needs and that it is then implemented in an appropriate way (G2). As an example, I was told that they were 'helping facilitate the conversations that will make [performance management] work because they are supporting local community networks work out how things affect them' (G1). They saw their role developing into one of offering a safe space not just to learn from experts but to share their practice ideas with confidence. This fits with the work by Ardichvili et al. (2003), who argue that within an organisation individuals are predisposed to share, but there must be trust that ensures that individuals feel safe from ridicule and/or confident that they are adding real value. As the CPS was shrinking, there were problems with both feelings of job insecurity and trust (G2, I4, I5).

The network personnel specifically see their role as enablers to support knowledge transfer: 'We act as links between communities. It's sometimes between managers, but now it's more between groups of managers in an organisation or specialist communities' (I5). There had been a growth in the number of communities across the CPS, for example a finance community and an HR community, but an aspect that they see as important is their independence: 'we don't sit in a specialist area. The other communities tend to be tied to a department and get their mandate from them. So communications community sits within the Communications Commission for example. […] it gives us more credibility and now people are seeking our advice on a range of things' (G2). This was identified as critical because there was less devolution of areas such as human resources, so local managers needed to be networked with each other in order to gain the requisite specialist knowledge. The knowledge transfer model can be seen to be moving towards a cartographic model (Earl 2001) in terms of the fact that network support personnel

need to know the location of the knowledge. However, they were also clearly working on supporting complex knowledge development (Blackman and Kennedy 2009) in a more managed way. This was being manifested in the growth of their virtual communities, which were being set up for both social learning and more specific knowledge transfer (G2, I5, I4, I6). In 2011, the research team had learnt of a major event, where thousands of managers would travel to be together as part of the Manager Support Network (Houle 2012). Resource issues prevent this type of event from happening now, and so there was much discussion of needing to develop new ways to enable the community members and other communities to interact, create knowledge, share ideas and develop new practice (G2, I5, G3, I1).

Throughout the conversation, the network personnel stressed that they were not the community: 'people will ask us things as if we are the community and we'll say "I don't know—I'll have to ask them" […] that's important as then the community know we remember our job is to make the network sing, we don't sing for them' (I5). They argued that they could only continue to be successful if they were trusted by both senior managers and their members. The network members needed to be assured that their views have been heard and represented accurately, whether it be in terms of what skills need to be developed or how realistic change might be as a result of a new practice. Senior managers needed to trust that what the CoP personnel tell them is representative of their members because they have set out to discover what skills were needed or what members were thinking. It is clear that the National Managers' Community has become more managerial in terms of its objectives, but it is still firmly viewed as an organisationally supported CoP.

Championing, Not Managing

The third area identified as enabling ongoing knowledge transfer success was the continued support of the sponsor, who ensured that the network gained appropriate access. It is noted in the literature that senior executives need to provide sponsorship to help communities reach their full potential (Borzillo 2009; Probst and Borzillo 2008). When the CoP was first developed, it had a strong sponsor, known as its champion, who believed in the merit of sharing practice at the middle management level. In 2011, the role of the champion was explained as being twofold: The first was to demonstrate to middle managers, through the presence of senior leadership, that the network was seen as having value. The second role was to work with the network personnel to gain support for the network with other senior leaders. There was a concern that

the network would either be overly influenced by senior management or it would not get enough support to enable managers to have the time to attend. The champion's role was to make sure that the network got the support it needed through influencing both senior colleagues and potential members, because 'one of the determinants of success for managers is the need to forge strong partnerships, making connections across organizations and levels. The National Managers' Community helps make that happen' (Guimont in Houle 2012, np).

In 2014, participants were asked whether the role continued and, if so, what was their perception of it. It was explained that not only does the role still exist nationally but that a similar role had also been created for each region (I5, G2). When asked why, the network personnel explained that the reasons were very similar in both cases and, in fact, that the role was more important than ever. As the CoP was seen to be such a core part of the supporting mechanisms for middle managers, if they were to remain independent they needed their champion to retain, and possibly gain, resources without being subjected to measurements that would undermine their capacity to be member driven (I5, I6, G2). The champion explained that they saw their role to be 'making it possible for an amazing group of people to do what they do well. What is great is the way the Network is developing into such a strong advocacy group and supporting managers across all the regions' (I6). All those involved recognised that the resource implications of the network were high; thus, a major part of the championship role was to stress the value that the network adds (Wenger et al. 2011). In terms of knowledge transfer, the champion became important, as a common problem with novel practice is a lack of opportunity to try out new things (Oksanen and Ståhle 2013; Quinn 1985). The perceived credibility of the CoP enabled middle managers to continue to get support to attend events, to have access online forums and so on, as well as encouraging senior managers to give their employees space to experiment.

Implications

As indicated earlier in the chapter when discussing 'Communities of Practice, Knowledge Creation and Knowledge Transfer' I outlined four core themes that are found within the literature and I now reflect on each in terms of the case example presented. The objective of this is to consider how the success of this case reflects upon the academic discussions of CoPs. In doing so, I show that when setting up COPs to explicitly encourage organisational learning, actively addressing the four themes will help to achieve success.

Is the Community of Practice Adding Value for the CPS?

As elucidated above, it was apparent that there was definite perceived value for all those involved. Of note was that there was clear *mutual* engagement, and the CoP was seen as a joint enterprise (Fuller 2007) where the membership worked together to achieve ongoing self and organisational improvements. This was not a traditional novice–expert style of CoP; instead, there were multiple modes of transmission—peer-to-peer, CoP to host organisation and CoP to specialist interest groups. The model of multiple experts sharing ideas with peers reflects Fuller and Unwin's (2005) observations that learning will emerge where there is a range of learning regions of interest or domains, and that it is the interactions between the regions that help to add learning value. In the case of this CoP, the move to a much broader network offered more opportunities to interact with different groups within the CoP, enabling the creation of new opportunities for social learning. Moreover, the new role played by the CoP caused creative tensions across the boundaries into the organisation as well. Thus, the success of this particular CoP can be seen to confirm that where all those involved perceive value, even though the value comes from different elements and utilisation of the knowledge created, the CoP will be able to maintain its identity. The concerns about power-brokering have not emerged and I suggest that this is because the obvious usefulness to both the individual and the organisation, right from the outset of the CoP's history, led to the support being offered to maintain the CoP's identity and trajectory , rather than wanting to shape it in some way.

Community Development

It is unsurprising that for a CoP to remain relevant to the membership and successful in terms of enabling social learning for the community, it will develop its practice over time (Snyder and Wenger 2010). In this case, from a small beginning being supported by one government department, the CoP now spans the entire CPS. This presents major challenges for ensuring effective activity but, as Wenger (1998) suggests, interaction does not need to be geographically co-located. Social learning needs interaction of some type, and trusted relationships supported by technology are likely to be more effective than physical meetings, where there is a reticence to share tacit knowledge (Jewson 2007). In this case, the use of subnetworks, virtual input and the ongoing employment of new technologies that are already part of the core employee experience enable social learning at a distance. It was noted that the

use of the same technologies as already in place for remote working, virtual team management and so forth meant that the CoP members increased their capacity to use these tools, which was another source of added value; and the CPS saw benefits as the tools became more embedded into practice.

Learning and Knowledge Creation and Transfer

From the analysis above, there seems to be no doubt that there is effective learning developing and being accessed throughout the CPS management employees. Moreover, this is now being accessed by others in order to create more effective policy. It is this perceived usefulness that is creating a virtuous circle where, because the effectiveness is tangible, the CoP continues to be supported. In part, this seems to be because the domain of interest (Snyder and Wenger 2010) remains constant and is perceived as useful throughout the membership and the host organisation.

What is of note is that there has been a development in what have been described as participant trajectories (Fuller 2007; Wenger 1998). The research in 2011 revealed a fairly traditional CoP, with inbound trajectories where newcomers joined in order to learn and benefit from the social learning activities. By 2014, there had been outbound trajectories, whereby some members had left through promotion, moving out of the CPS, or due to a perceived lack of usefulness. Noteworthy, however, is that while some senior staff had moved out of full membership of the CoP, they were still engaged in boundary activities, working with the CoP in terms of both supporting knowledge transfer or accessing and using the knowledge that they knew existed. This internal and external recognition of the knowledge being made accessible to the CPS explains, at least in part, the significant growth in both CoP membership and standing between 2011 and 2014. It is apparent that the CoP is seen as one of many mechanisms that will ensure that new learning is created and applied, and it is this pragmatic view that enables it to grow and change in ways that support its members and those with whom the membership interact.

Development and Support Mechanisms

The analysis clearly shows not only that there is ongoing and increasing backing for the CoP but that the organisational support is carefully tailored to encourage, but not take over, the autonomy of the membership, thereby

upholding and encouraging the high levels of trust. There are many examples of CoPs that emerged organically as a result of likeminded people desiring to undertake social learning around a shared passion or area of interest. However, many falter when attempts are made to formalise, expand or manage them. The key for success in this case appears to be the systems that have been put in place around the CoP, but there has been no attempt made to move the ownership or scope and style of social learning. This is one of the reasons why the CoP under discussion demonstrated high levels of trust throughout its history, which emerges as a key lesson for supporting CoPs effectively in the future.

Reflecting upon the definition of a CoP adopted for this chapter, it stresses that it represents a place where there is a common set of interests and passion to learn within a group. Clearly of importance is enabling the individuals within the CoP, as well as the group itself, to maintain and develop their identities as they are related to the social activities and participation that lead to learning. Participation in the group enables meaningful activity (Handley et al. 2006), which both taps into incoming identities and then develops new ones until people leave the CoP. For the CPS to have managed both to support and encourage the ongoing changes to the CoP, without directing it, has been a difficult, but apparently advantageous, achievement.

Lessons Learnt

The research described in this chapter emerged through an interest in why, despite considerable research into CoPs, many became less relevant over time, even though there was still an ongoing need for new knowledge to be created within an organisation, while others remained successful. The ideas developed from the case study presented can be seen to support research that suggests that for CoPs successfully to enable ongoing knowledge creation and transfer, a CoP must be sustained as it develops over time. This requires the developing of organisational strategies that will foster learning achievement, maintain the commitment of both the members and the organisation and support the CoP to develop from the inside out (Corso et al. 2009; Wenger et al. 2002; Wenger et al. 2011).

Strong relationships are advocated between the leaders of the CoP and their sponsors, as well as creating ways to measure, assess and demonstrate value (Probst and Borzillo 2008; Wenger et al. 2011). These strong relationships and ongoing support were clearly evident and explain some of the ongoing

success of the CoP under study. However, this case also highlights some nuances in terms of how to ensure that the CoP remains relevant over time.

- A core tenet of success was considered to be the apparent lack of formal governance. There is a network committee and a secretary but, as indicated above, they see their role as to support and possibly steer the network but not manage or lead it. They are enablers of the CoP, which is still driven by its members. Some of the tasks that they undertake are more managerial in nature, such as running the soft skills workshops, but they do so in order to fulfil a CoP need to create appropriate knowledge and knowledge capital.
- The National Managers' Community is not given targets by the CPS to be measured against and it was a real concern raised by both the network personnel and the champion that if they were then this would prevent the ongoing emergent nature of the knowledge being created. The trust of the members in their CoP would thus be lost, as they would see it becoming part of the institution, rather than existing to support them to do their jobs well.

In this chapter, I have shown that it is possible to have a large, ongoing CoP that continues to develop and add value from multiple perspectives. I suggest that the capacity successfully to transfer knowledge within the CoP and into the CPS is found in: the organic, bottom-up nature of its growth; the continued focus on management development, such that its core purpose and identity is stable; high levels of trust apparent for the CoP by the CPS leadership and inside the CoP by the membership; and the loose governance structures that support but do not apply external power.

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11

Internalised Values and Fairness Perception: Ethics in Knowledge Management

Isabel D. W. Rechberg

Introduction

Is there the need for ethical consideration in knowledge management (KM)? The OEDC (2015: 28) suggests that 'knowledge-based capital is essential to investment and growth', and vital for the 'improvements in human well-being' (World Bank 1998: 1). An unequal distribution of knowledge poses great difficulties within and among nations (OECD 2015; World Bank 1998). 'Knowledge is power' (Francis Bacon 1857), and processing knowledge for corporate gain is important for corporate competitiveness. KM is the practice by which knowledge is managed in organisations. If incorporated well, KM functions as an enabler of corporate performance (Andreeva and Kianto 2012; Wang et al. 2016), innovation and product development, team and organisational performance, cost reduction and sales growth (Adam and Mahadi 2016; Hu and Randel 2014; Im et al. 2016; Lin 2007; Wang et al. 2014).

Where knowledge is power, and KM is used as a practice to aggregate and enrich corporate power, ethical issues will arise (Chatterjee and Sarker 2013; Holsapple and Joshi 2004; Mingers and Walsham 2010; Spender and Scherer 2007). Knowledgeable individuals working for an organisation are the source of knowledge, and KM practices are the medium used by organisations to enable knowledge-processing for corporate gain. A conflict of knowledge ownership occurs where individual knowledge is appropriated (Rechberg and Syed 2013).

I. D. W. Rechberg (✉)
School of Business, The City University of New York-College of Staten Island, New York, NY, USA

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The dominant outlook on KM is positive; yet, where knowledge is managed in organisations without ethical considerations, such an outlook is both 'paradoxical' (Evans and McKinley 2010; Land et al. 2007) and 'utopian' (Alter 2006). Knowledge processes, such as the application, creation and sharing of knowledge have a definite ethical dimension (Holsapple and Joshi 2004). Organisations treating knowledge independent of its source—the individual knowledge carrier—causes an ethical dilemma (da Costa et al. 2010), while ethical issues often remain neglected in KM theory and practice (Bryant 2006; Evans and McKinley 2010). With this study we aim to bring attention to the fact that 'knowledge is power' and 'knowledge is ethics' correlate to individuals' knowledge-processing behaviour. We explain the need to consider individuals' internalised values and fairness perception as driving knowledge-processing, when intending to manage knowledge. It is argued that it is through ethical considerations in KM that knowledge may be processed in order to enable organisational and individual growth.

To develop our argument for an ethical agenda in KM, we first discuss the source of knowledge—the individual person. We address that knowledge is power and note the struggle that resides within it. We then turn to the essential link between knowledge and ethics, followed by a discussion of internalised values, held by individuals and organisations in relation to KM and knowledge processes. The fairness perceptions of individuals and organisations that govern KM are discussed, followed by examples of knowledge-processing, such as knowledge-sharing and creation to illustrate how power and ethics impact such processes. In the discussion, we advise for ethical considerations in KM research and practice, before highlighting the implications and further questions that support our claim, followed by the limitations and conclusions of this study. In this chapter, 'the organisation' refers to a large private corporation, an academic institution, a small firm or a government agency. The 'individual' or 'employee' is the employed person in an organisation and the source of all knowledge.

The Source of Knowledge: The Individual Employee

In KM research, the emphasis is on group processes and organisational decision-makers (e.g., Baba et al. 2004; Chang and Wang 2009; Choi et al. 2010; Germain 2011; Jafari et al. 2012; Kirkman et al. 2011; Riantoputra 2010). The positive impact that KM can have on an organisation is, however, enabled through

employees engaging in knowledge-processing (Rechberg and Syed 2012). The word knowledge originates from the words 'know', 'ken' and 'can' (as in 'canny') and refers to 'the theoretical or practical understanding of a subject' by an individual person (OED). Knowledge is the ability, skills and awareness acquired through a person's *sense-making* of the world (Weick 2001). All knowledge is originally rooted within the individual person and the individual is the source of knowledge and knowledge-processing (e.g., Polanyi 1998; Wright 2005).

Knowledge managed in corporate settings is explicit or tacit in nature. Explicit knowledge, such as information and data, forms through individual employees participating in the codification of knowledge. Knowledge transformed into data can be shared, stored and transferred, for example through information systems. In this case, an information system may become the source of explicit knowledge owned by an organisation. Kaufmann and Runco (2009) explain that knowledge owned by the organisation can, however, only be of value if individual employees engage with it. Or as Azmi (2010: 62) clarifies, 'the success of any knowledge management system is dependent upon people willing to codify and store their knowledge'. Without individual sense-making of data, IT systems remain of little use.

It is, in particular, tacit knowledge that can lead to a competitive advantage (Von Krogh et al. 2000). Tacit knowledge is so valuable because it is needed for knowledge creation (von Krogh et al. 2000). Tacit knowledge is embrained, embodied and embedded within the individual who carries it, and is private to that individual (Collins 1993; Tywoniak 2007). Tacit knowledge often remains so and may only be made explicit through individuals' participation in the corporate space (Nonaka 1994). Wang (2004) notes that knowledge will gain value if shared, and knowledge-sharing is reliant on employee enthusiasm to participate (Ruppel and Harrington 2000; Song and Chermack 2008).

Organisational knowledge is not simply a collection of individuals' knowledge but rather the outcome of individuals' participation in knowledge processes in the corporate space (Spender 1994). An organisation may seek to manage the knowledge source—the individual knowledge carrier—less than knowledge itself. Where knowledge is power, individuals may, however, be reluctant to share what they know.

Knowledge Is Power

Organisational researchers have called for the need to address the link between knowledge and power (Heizmann 2011; MacKinlay 2002; Rechberg and Syed 2013). Recognition of this link dates back to Francis Bacon (1857), who

first stated that 'knowledge itself is power'. Foucault (1977: 52) explains that knowledge and power coexist, and that 'it is impossible for knowledge not to engender power [as it is] not possible for power to be exercised without knowledge'. The Organisation for Economic Co-operation and Development (2015) finds that numerous developed and developing nations now invest more in knowledge-based capital than traditional capital. Knowledge is treated as power primarily in the capitalistic context (Glisby and Holden 2003), where knowledge is the source for competitiveness (i.e., Abeson and Taku 2009; Carneiro 2000). Knowledge is power because effective management of knowledge enhances corporate performance (Andreeva and Kianto 2012; Wang et al. 2016). The link between knowledge and power is also found in 'knowledge culture, knowledge alliances, knowledge strategy, knowledge organisations, and knowledge processes' (Baskerville and Dulipovici 2006: 91)

Knowledge is power for the organisation and for the individual. Individuals are hired and retained for their embodied knowledge base and sense-making ability. Organisations attract and then seek to manage individual knowledge through KM practices. Bryant (2006) is concerned that organisations use KM practices in order to increase the power of the organisation over that of individual employees. Since knowledge is the source for organisational competitiveness but also for the individual knowledge carrier, a conflict of knowledge ownership can occur (Rechberg and Syed 2013). Blackler (1995) defines this as the conflict between knowledge as the commodity an organisation seeks to process and sell and as individuals' active, living experience of knowing.

Knowledge is the source for competitiveness of organisations, as much as knowledge is an individual's sole source of bargaining power. An organisation's intention to translate individual tacit knowledge into explicit forms, stored in the organisational infrastructure, may lead to the loss of employee indispensability (Bryant 2006). That an organisation takes advantage of its power over the individual person is a valid concern. Where knowledge is power, inherent to the individual and used by organisations to compete, ethical questions arise; for this reason, we turn to a discussion on ethics and knowledge.

Ethics and Knowledge

Ethics may be relevant to the philosophical foundation of KM (Spender and Scherer 2007). KM practices occur in social systems, causing knowledge processes to have an ethical dimension that needs consideration (Chatterjee and

Sarker 2013; Holsapple and Joshi 2004; Mingers and Walsham 2010). Ethics is a practical discipline and the source for critical guidelines in the conduct of life (Tseng and Fan 2011); it is the study of morality where morals represent standards used to judge right from wrong, independent of our subjective perception of them (Deigh 2010; Stahl 2008). The word 'ethics' derives from the concept of 'custom', where ethics amounts to the value system embedded in the community where we live (MacIntyre 1985; Stahl 2008). Ethics is ambiguous and holds no immutable truth; it follows David Hume's law of 'ought to', addressing how one ought to live and what actions one ought to take in the conduct of life (Hume 1750). An action is ethical if one behaves ethically (Mingers 2011); if the action taken reaches an ethical conclusion (teleology (Mill 1861)); or if the action is in itself conducted in an ethical manner (deontology (Kant 1785)).

Ethics needs consideration, as knowledge and ethics have synonymy (Courtney 2001). Aristotle said: '[t]o be ethical is to be knowledgeable and to be knowledgeable is to be ethical' (in Chatterjee and Sarker 2013: 454). Only with an ethical outlook may knowledge transform into wisdom (Evans and McKinley 2010), and only through theoretical as well as practical knowledge may an individual act ethically (Rowe and Broadie 2002). Together with knowledge, ethics determines how we make sense of the world, guiding individuals' internalised values and fairness perceptions. The ethics that an individual holds affect their attitude towards KM practices as well as their ability to interpret and process, reflect on and value knowledge made available to them. This link between ethics and knowledge-processing needs consideration and will be discussed in the following sections.

Internalised Values

An individual's sense of accountability, duty and reliability is driven by internalised values, and so an individual's participation in KM practices is guided by their internalised values (Bivins 2006). An individual may progress through three levels of value maturity during the course of their life that will impact their behaviour, attitudes and interpretation of the world, and their KM practices. Kohlberg (1981) identifies these three stages of development: namely, the pre-conventional, conventional and post-conventional. Victor and Cullen (1987) call the three stages egoism, benevolence and principle, categorised under their ethical climate criteria.

The pre-conventional or self-centred stage, is the first stage of an individual's value development; here egoism and personal profits rule behaviour.

During the pre-conventional stage, an individual may seek to acquire knowledge through others while hoarding their own—free-riding. During the conventional stage, an individual acts based on benevolence. The individual thrives on social approval and will share valuable private knowledge in order to receive management approval. The final stage that an individual may elevate to is the post-conventional, where individuals act on internalised core values or 'self-chosen ethical principles' (Damico 1982: 432). These values may differ from widely accepted social norms and may cause opposition. One nonconforming behaviour may be sharing knowledge that the organisation has declared as confidential; the individual may perceive sharing such knowledge beneficial to the greater good—whistleblowing.

Since an individual's behaviour is motivated by their internalised values, management faces a complex situation (Yeoman and Mueller Santos 2016). The national culture that an individual grows up in has a profound impact on their ethical understanding and behaviour (Su 2006). Yet, the values that an individual holds are as private to that individual as is knowledge in itself. Ethics are often brought to the workplace and not developed within the organisation (Lee and Cheng 2012). What a knowledge worker perceives as fair may promote or hinder their knowledge-processing and differ greatly from values put forward by their organisation. The standards by which knowledge is processed in the organisation are often driven by corporate, not individual values. In the corporate setting, individuals are given guidance to respect collective ethical norms (Tseng and Fan 2011).

McCuen (1998: 41) explains that 'individuals assign different weights to different values, which has important implications for the professional life'. An individual's values may change over the course of their lives, and will impact their participation in knowledge processes. Aligning corporate and individual values is difficult; where organisational values and those of individuals contradict, KM practices may not be supported (da Costa et al. 2010). Janz and Prasarnphanich (2003) warn that the assumption that individuals will subordinate their personal values to that of the organisation is misplaced. Where knowledge is power, an individual's fairness perceptions will influence the extent to which knowledge will be processed for corporate gain. A person's fairness perception is based on their internalised values and has a profound impact on individuals' knowledge-processing behaviour. For this reason, individuals' fairness perception has to be addressed, and will be discussed next.

Fairness Perception

For Hayes and Walsham (2003), organisations promote their being knowledge-intensive firms in order to enforce conformity. Here 'tacit knowledge of the workforce is […] a resource to be willingly shared by all' (MacKinlay 2002: 77). Knowledge, when processed, is then property of the organisation. Such an approach to KM may be counterproductive, as an individual's fairness perception may lead to knowledge-hiding, rather than knowledge-sharing.

Fairness is a social practice driven by an individual's internalised values and their perceived organisational justice (James 2012). Justice can be conceived of as ethics in practice, and is tied to corporate implementations. Organisational justice is based on four dimensions: interactive, informational, distributional and procedural justice (Colquitt and Shaw 2005). Interactional justice reflects the quality of the interaction between individuals in the workplace (Colquitt et al. 2001), whereas informational justice refers to the quality of the communication (Suliman and Al Kathairi 2013). Procedural justice implies fair resource allocation (Colquitt and Shaw 2005), and distributive justice is driven by the fair allocation of resources, including remuneration (Adams 1965; Chen et al. 2010). Employees' attitudes and behaviours are influenced by their perceived fairness of organisational practices. Where perceived justice is served, there is a positive correlation with job satisfaction and organisational commitment (i.e., Bakhshi et al. 2009), job performance and organisational citizenship behaviours (i.e., Rezaiean et al. 2010), trust (i.e., Chiaburu and Marinova 2006) and a negative correlation with employee turnover (i.e., Al Afari and Elanain 2014).

Like values, what is perceived as fair is as personal to an individual as is knowledge in itself. Internalised values brought to the workplace will influence individuals' interpretation of the fairness of KM practices, and whether they feel justly treated. Managing knowledge may be challenging if the profits reached through successful processing of knowledge are 'preserved solely at the level of the organisation or the decision-maker, rather than the level of the individuals in an organisation' (Quintas et al. 1997: 30). KPMG (2002) matches this approach to KM, stating that intellectual property owned by an organisation also includes individual know-how. Individual's 'sharing knowledge represents a kind of organisational "good"' (Wang 2004: 374). And the argument may be made that an organisation rightfully claims ownership over individual knowledge, as knowledge is developed through the support of the organisation (Argandona 2003).

An individual's refusal to share knowledge hurts the organisation and is interpreted as unethical behaviour (Lin 2007). Where individuals share the view that knowledge-processing is 'usual, correct, and socially expected workplace behaviour' (Constant et al. 1994: 404), KM practices can be successful. Knowledge is, however, the source of power, not only for the organisation but also for the individual. Organisations claiming ownership over individual knowledge may be perceived as carrying out unfair treatment (Glisby and Holden 2003), leading to a conflict of knowledge ownership (Rechberg and Syed 2013).

Assuming that the participation in KM practices is a part of work ethics may be morally persuasive (Chan and Garrick 2003) but 'cannot be successful, and [could] result in social and economic havoc' (Bryant 2006: 9). Peter Drucker (2001) reminds KM theorists and practitioners that 'in a knowledge economy there is no such thing as conscripts, there are only volunteers'. Furthermore, even though individuals seek to act ethically, their fairness perception matters and is influenced by their concern for efficiency and need (Konow 2003). We turn to examples of knowledge-processing to illustrate how fairness perception and the struggle around knowledge as power may impair knowledge-processing.

Knowledge-Processing

An individual's attitude towards knowledge-processing will have a profound impact on their knowledge-processing behaviour (Kuo and Young 2008). Knowledge-processing is entirely self-motivated and controlled at the level of the individual; it cannot be forced. Knowledge private to the individual is often hidden in their minds and cannot be managed if not shared. An organisation is dependent on an individual's goodwill to reveal knowledge. The full volume and quality of knowledge in an organisation may never be entirely known. Even an individual may struggle knowing what they know, yet where an individual perceives the corporate environment as unfair, knowledge may deliberately be hidden, hoarded or manipulated. Where knowledge is power and is treated as such in the corporate context, the quality of knowledge-processing and the quality of the knowledge being processed may see a profound negative impact.

An individual's willingness to participate in KM practices is determined by their internalised values and fairness perception. Sharing knowledge results from the intrinsic motivation to share, a motivation that is largely dependent on a shared intention between the individual and their colleagues (Wasko and

Faraj 2005). In their comparative study of Chinese and Russians, Michailova and Hutchings (2006) found that Chinese individuals are more inclined to share knowledge, as their values follow the interests of the collective group. In contrast, Russian employees will share knowledge only if it profits their own interests.

Ethics is a question of individuals' interaction with their environments. The ethicality of the context within which the individual ought to participate impacts knowledge-processing. Michailova and Husted (2003) found that a hostile work environment will hinder knowledge-processing. The contextual environment, the interpersonal relationships and the exchanges taking place ought to be ethical (Fray 2007). An individual may ask, 'how should I live within and by my company?' (Fray 2007: 77).

Individuals participating in KM practices may be motivated by a feeling of moral obligation (Tseng and Fan 2011). 'Guilt may develop if workers refuse to share their knowledge with others and disobey the ethical codes in their mind' (Wang 2004: 380). Yet, where knowledge is power, a fair-minded individual will not always behave fairly (Fehr and Schmidt 2001). The awareness that knowledge is power may lead individuals to treat knowledge as part of their job security, rather than as the common good (DeLong and Fahey 2000), as knowledge-processing is a trade-off between 'self-interest and ethical concerns' (Wang 2004: 380).

Knowledge is a greater source of power if held privately with the individual knowledge carrier (Larrat and McKinley 2004). Sharing knowledge may negatively impact the weighted value of knowledge. Workplace competition can have a negative effect on knowledge-processing. If workplace competition is high, so is an individual's self-interest (Wang 2004). A competitive working environment will caution individuals to share their sources of power, and they may be concerned about the possibility of becoming obsolete when sharing their knowledge with colleagues, and so hoard it instead. Chow et al. (2000) suggest that an individual will refrain from sharing knowledge when doing so will harm their self-interest. This behaviour was more commonly found among employees in the United States, and much less so among employees in China.

The knowledge–power struggle affects knowledge processes throughout corporate infrastructure. Eagerness and willingness to share knowledge mediate between an individual's pride and intention to process knowledge (van den Hooff et al. 2012). An individual may be expected to process knowledge as part of their job, but an individual may choose only to share knowledge if they receive valuable knowledge in return (Bolender 2003).

Knowledge-processing may also be motivated (Bolender 2004) or hindered (Wang and Noe 2010) by positional power. A higher ranked individual may be inclined to share knowledge with a lower ranked individual in order to elevate their authority. In reverse, a lower ranked individual may share knowledge with their leadership, motivated by favouritism. In contrast, the level of seniority may cause an individual of lower rank to feel discomfort when sharing knowledge. Elenkov (1998) established that Russian employees may hoard knowledge out of respect for hierarchy and formal power. Higher-ranked members in an organisation may also use their position power to gain access to valuable knowledge (Bolender 2003), and sharing knowledge with colleagues can be motivated by existing power differences (Bolender 2004).

Position power may also influence to what extent an individual's knowledge is valued by others. In their case study research in the United Kingdom, Rechberg et al. (2013) discovered that knowledge of production among factory-floor employees at a UK company remains unexplored and undervalued. The weighted value of individual knowledge is therefore also impacted by the position held in the organisation. An individual may ask: Are me and my knowledge valued? If the answer is no, individuals may be more reluctant to share knowledge.

Valuing knowledge has an additional dimension. An individual's internalised values affect the degree to which available knowledge is treated as important. Subjectivity governs values held and they are thus 'rarely the subject of absolute standards' (Land et al. 2007: 3). Knowledge is valued by an individual's opinion of it. An individual may not be aware that the knowledge they hold is of value and thus refrain from sharing it. If left untouched, knowledge is simply tacit or explicit knowledge, yet never a source of power. Only if valued will knowledge be drawn on and interpreted. Yet, how knowledge is interpreted is up to the individual. Knowledge can therefore only be a source of power if an individual seeks to make sense of knowledge presented.

The extent to which knowledge is valued has a profound impact on corporate performance. The foreignness encountered between individuals, groups and organisations, based on varying internalised values, can lead to knowledge loss. Harvey and Novicevic (2000) explain that 'global organisational ignorance' causes misinterpretation, errors and delays in knowledge-sharing. Furthermore, Schmidt and Sofka (2009: 462) explain that 'barriers to knowledge flows such as social, cultural, cognitive, administrative, institutional and organisational differences' are not automatically removed when joining foreign direct investments. Familiarity and similarity between individuals meant to process knowledge matters, as does the extent to which individuals are perceived to be rightfully entitled to share and receive knowledge.

Driven by internal values, knowledge may be valued variously by different individuals. In particular, an individual who has reached the post-conventional stage, may value knowledge differently to their organisation. Unused knowledge may suddenly be a discovery. Or knowledge meant to stay hidden could be shared through whistleblowing. If an individual's values are shared by the community, then their act may be praised and rewarded. But when acting against corporate values, the actor will be punished.

King (1999) analyses that individuals working in vertical organisational structures are more reluctant to report the wrongdoing of their colleagues. The corporate culture impacts individuals' attitudes towards whistleblowing (Park et al. 2008). Sims and Keenan (1999) explain that the link between the cultures within which the individual resides and their whistleblowing behaviour may be based on an individual's sense of belonging. The authors find that individuals in a collectivist culture are more likely to refrain from whistleblowing in order to maintain harmony within the group. In contrast, individuals from individualistic cultures are more inclined to represent their internalised values. Japanese executives, for example, will not report wrongdoing in order to protect their job security (Chikudate 2002) and Chinese employees are significantly less likely to blow the whistle on colleagues than American employees (Michailova and Hutchings 2006).

A further dimension of the sharing of confidential information occurs on the corporate level. An organisation may see it as reasonable to share confidential information, such as customer-related data with, for instance, a marketing firm. Ethics and business interests impact corporate policy. Often, however, economic profits are inconsiderate of ethics (Chatterjee and Sarker 2013: 472).

Internalised values also drive knowledge accuracy. Knowledge manipulation is a construct in the struggle between knowledge, ethics and power (Lee and Cheng 2012). The power that knowledge holds is impacted by its quality. Whether knowledge shared is complete also impacts its outcome. To gain or maintain power, 'knowledge can be created, omitted or withheld, suppressed, amplified or exaggerated, diminished or distorted' (Land et al. 2007: 2). Accidental knowledge manipulation may occur during the transcription of tacit knowledge into codified knowledge (Alter 2006). Knowledge may also be abstracted purposefully. Where knowledge-sharing is compulsory, or where peer pressure is high, individuals may be reluctant to share what they know. Instead, individuals may 'compromise by sharing some knowledge with their colleagues while hiding other knowledge' (Wang 2004: 379). True knowledge-sharing is not guaranteed, and where individuals perceive unfair treatment, purposeful knowledge-hoarding is the result. Similarly, an organisation may manipulate

knowledge to accomplish their goals, and 'the management and manipulation of knowledge and information provide one of the principal means to achieve this' (Land et al. 2007: 5).

Where knowledge is power, reaped by the organisation, individuals may not be willing to share knowledge. Knowledge creation is the most powerful and delicate knowledge process individuals can engage in (Von Krogh et al. 2000). It is the most powerful because it is through knowledge creation that innovation can take place. Knowledge is created either through individuals interacting with already existing explicit forms of knowledge or through socialisation in space (Nonaka 1994). Although knowledge may be created in isolation (Polanyi 1998), individuals interacting with each other is the most value-adding knowledge process available in organisations. Outside forces also influence the socialisation process. Knowledge creation is particularly vulnerable to 'expert, structural, or other forms of power, peer pressure, and efficiency imperatives, real or imagined' (Chatterjee et al. 2009: 142).

In circumstances where individuals feel that sharing knowledge is obligatory, without perceiving that doing so as fair, knowledge shared may be altered or hidden altogether. Half-truths or white lies may be the result. The dynamic of knowledge as power and individuals' internalised values can greatly manipulate and obstruct knowledge creation. Competition, position power and fairness perception impact the extent to which knowledge will be processed and the quality of knowledge processed. We next turn to discussion and implications of the search for solutions for the knowledge-power-ethics dilemma.

Discussion

The aim of this research was to highlight the effect that internalised values and fairness perception have on individual participation in knowledge-processing. We learn that the context within which knowledge is meant to be processed matters a great deal (Tseng and Fan 2011). Scarbrough (1999) sees the management of an organisation as the agency by which individual knowledge is exploited for corporate gain. Using individuals and their knowledge as the means to an end for organisational gain may be morally unjust, sparking ethical concerns, and be counterproductive. In today's labour market, lifelong employment is rare and individuals' knowledge is often their only source of job security. Individuals are required to invest in building knowledge to compete in the labour market, to develop and share knowledge to stay competitive and keep enough knowledge hidden to remain of value to the organisation. In a context perceived as unfair, knowledge will not be processed.

The dynamic of 'knowledge is power' leads organisations to claim ownership over individuals' knowledge, makes already highly sensitive knowledge-sharing and -creating processes much harder (Rechberg and Syed 2013). An organisation is not required to use its strength against an individual. Dilenschneider (1990) explains that it is morality that will determine how KM can be either a discipline of mutual empowerment (see Rechberg and Syed 2013) or the source of growing inequality (see Bryant 2006). Appropriating individuals' knowledge for corporate gain is ineffective (Rechberg and Syed 2014)—if an individual is feeling exploited, they will obstruct knowledge-processing.

Knowledge created in the corporate space may be sold by organisations, yet it may never be owned by organisations (Jasimuddin et al. 2005). The extent to which an organisation can claim ownership over individual knowledge depends on the individual's ability, willingness and interest to share knowledge (Wasko and Faraj 2005). If treated unfairly, individual ethics and goodwill may be compromised, jeopardising knowledge-processing. Organisations intending to manage knowledge thus need to do well in understanding the source of knowledge: the individual employee and their needs.

For KM practices to withstand the knowledge power struggle, ethics need to be taken into consideration. Ethics can mediate knowledge processes and guide in developing fair KM practices. Aligning individual and organisational values may, however, be difficult. Sims (1992: 34) explains that organisations often solely consider corporate performance and that resources are scarce to address the 'moral content of organisational decision-making'. Morals, the author states, are often seen as 'esoteric', lacking 'substantive relation to objective and quantitative performance' (Sims 1992: 34). Notwithstanding, if KM practices are meant to contribute to corporate performance, then ethics need consideration.

Tseng and Fan (2011) address the need for an ethical culture in KM. To establish an ethical climate, a paradigm shift in KM practice and theory is needed (Nonaka et al. 2008). The assessment needs to shift from knowledge as an asset, to knowledge as a process enabled through individuals' participation (Rechberg and Syed 2013; Wang 2004). Under this framework, organisations provide the corporate space to enable knowledge-processing; identified as *ba* by von Krogh et al. (2000). An ethical organisational climate can be constructed on Kahneman et al.'s (1986) principle of 'dual entitlement'. Built on benevolence and shared principles, both parties, the individual and the organisation, are entitled to fair compensation. A rightful incentive might then go beyond financial compensation, and be based, for example, on a combination of financial benefits and, where applicable, official recognition as an expert in a certain field (Davenport and Prusak 1998).

Individuals care about fairness, as fair practices lead to fair interpersonal relationships and moral principles (Cropanzano et al. 2001). A fair approach to KM is also beneficial to the organisation. Konovsky (2000) found that when treated fairly, individuals have a positive attitude towards their colleagues and the organisation, are satisfied with their job, are committed to their organisation and feel a sense of trust (see also Colquitt et al. 2001; Li et al. 2017). Fair KM practices also foster knowledge-sharing and innovation (Bosse et al. 2009), a knowledge-sharing culture (Hislop 2003) and a sense of safety when processing knowledge (Rechberg et al. 2013).

A fair work environment is also important when developing corporate wisdom. Wisdom can be a powerful antecedent for individual and corporate competitiveness (Evans and McKinley 2010). Knowledge coupled with ethical consideration forms wisdom. The more reflective an organisation, the higher its ability to foresee and guide behaviour. Wise corporate practice may sustain knowledge manipulation and increase stakeholder satisfaction. Organisations gain wisdom through developing wiser organisational members. Drawing on individuals' 'tacit nature of ethical knowledge' knowledge can transform into wisdom (Lee and Cheng 2012).

If not treated and incorporated in an ethical manner, knowledge may be hidden, manipulated and of lesser value. In the next section, I provide suggestions to enable ethical and effective KM practices.

Implications

Only through appreciating individuals' internalised values may knowledge be fully utilised as a source of power. Corporate influence, Dilenschneider (1990: xviii) explains, is in itself not negative, 'it is the morality with which influence is used that makes all the difference'. An organisation can draw on Lawler's (1986) 'high-involvement management'. Through promoting active participation in the dialogue on KM, aligned with freedom of expression and incorporating individuals' suggestions, then individuals' fairness perception can be satisfied.

Those holding positions managing others may play an important role in developing a corporate environment that enables knowledge-processing. Managers in organisations may obstruct knowledge processes, as they are trained to 'manage conscripts', not knowledgeable individuals (Drucker 2001). Since the unfair treatment of individuals leads to knowledge-hoarding and manipulation, management's agenda to enable knowledge-processing should shift from developing initiatives on how individuals ought to process

knowledge, to strategies on how to empower individuals to willingly process knowledge.

Management of knowledge is impossible without the organisation's ability to align individual values with its own. Shifting the management role from controlling to facilitating knowledge-processing, Nowakowski and Conlon (2005) suggest considering corporate and individual values: corporate values including the corporate culture, structure and mission; and individual values, their work experience, personality and expertise. To establish fair corporate practices where both individual and organisational values are incorporated, one can draw on Yeoman and Mueller-Santos' enabler for effective communication: 'Mutual respect, openness and availability of information, readiness to listen to different points of view and commitment to the outcome' are necessary for individuals to be able to voice their concern and to be heard (2016: 5). By systematically prioritising different competing internalised values, KM practices can be established that are fair to the individual and the organisation alike.

To remedy power impairing knowledge-processing, and to develop a reflective and fair environment for individuals to feel driven to process knowledge in, trust is needed—between individuals and in the employer. Trust is built on commonly shared values, as well as honest, reliable and predictable behaviour (Fukuyama 1995). Building trust is difficult, so Coleman (1990) suggests starting to develop trust in smaller homogenous knowledge-sharing groups.

KM practitioners may draw on Gourlay (2006), suggesting indirect management practices to facilitate knowledge-processing. Embedding fairness into corporate strategy can benefit KM practices and mobilise individuals to process knowledge. An individual's awareness of knowledge as power may impact their willingness to process knowledge. An individual's internalised values and fairness perception will impact the extent to which individuals perceive KM practices to be fair. Their interpretation of the practices thus has a profound impact on their knowledge-processing behaviour. During their case study research, Rechberg et al. (2013) found that through the integration of individuals in KM decision-making, knowledge can be effectively managed.

In this context, practitioners may rethink the role of management in KM. Whereas management of knowledge may hinder knowledge-processing, a leadership approach may be able to facilitate knowledge-processing, acknowledging individuals' needs and thereby empowering them.

Researchers may wish to address the current shift to individualism away from collectivism; it is one that will have profound implications on individuals' knowledge-sharing behaviour. Moreover, the impact of globalisation on

knowledge processes needs consideration where internalised values and fairness perception may clash between individuals who ought to work together. How can such diversity be brought under one umbrella?

The KM research community, in particular, has a moral obligation to promote ways for fair and effective KM practice. The effective management of knowledge can be an important contributor to individual progression, organisational success and national competitiveness. Knowledge and knowledge processes have a private base and knowledge is owned by the individual who carries it. Nonetheless, the KM discipline largely focuses on the positivist, quantifiable, explicit element of knowledge that is external to the individual and can be managed by managers. The focus is less on seeking to understand knowledge processes in the context of the individual creating and interacting with knowledge. If approached through a traditional management paradigm, knowledge cannot be managed. The discipline is in need of a paradigm shift from the management focus to a focus on individuals and their needs.

Future Research

There is room for research on the ethicality of KM. This review has only touched on the impact that internalised values and fairness perception have on knowledge-processing, leaving many questions. Can a KM practice be established that meets all contributors' needs? Or are individuals' internalised values too diverse to bring into complete agreement? Cross-cultural, cross-industry and cross-functionality studies may find trends of internalised values and fairness perceptions.

Is there ethicality in the way knowledge is managed in organisations? Or are KM practices purely driven by self-interest and greed? One may draw on the legal system to determine the true right that an individual has over their knowledge. Inequality between individuals, organisations and nations is increasing, not declining, and knowledge is the key ingredient to smoothing out such differences. Is the act of de-privatising knowledge though KM practices a deliberate act? Is KM a practice of the organisation or should it be a tool kit for the knowledge carrier—that is, personal KM (Pauleen 2009).

May it add value to determine if there are moral obligations for individuals to process knowledge, and if an individual might participate in KM practice in a right or wrong way? Is unfair treatment only perceived in some corporate roles and by subordinates? Or is management in a position to hoard knowledge as well? Can knowledge manipulation and hoarding ever end? How will it then ever be possible to experience true knowledge accuracy? And can

organisations thrive without it? Lastly, reflecting on corporate and individual wisdom in relation to knowledge-processing behaviour may be a study that can bring valuable insights into the need for ethics in KM practices.

Conclusion

Addressing the dynamic of knowledge power and ethics, this study has questioned the ability to manage knowledge in organisations. Knowledge is private to the individual; corporate explicit knowledge is only a source of power if processed by individuals. The internalised values that individuals hold determine their willingness to process knowledge. Where an individual holds values different to those of the employer, and KM practices are perceived as unfair, knowledge may not be processed. Ethical consideration in KM is essential for the discipline to be effective. To be an organisation with proper ethical consideration, managers ought to take into account not only organisational, but also individuals' needs. Only by understanding the source of knowledge—in other words, the individual—will it be possible to manage knowledge in organisations.

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12

Knowledge Assets: Identification and Integration

Juani Swart, Cliff Bowman, and Kerrie Howard

A review of the literature on knowledge assets reveals a tendency to focus on isolated subcomponents in considerable detail, often combining theoretical strands such as human capital theory (Becker 1964), the resource-based view of the firm (Barney 1991) and social capital theory (Burt 1992; Granovetter 1973; Uzzi 1996). Although these developments are most useful in enriching our understanding of the knowledge assets that underpin firm performance, they do not stipulate what knowledge assets *are* and *how* they combine to generate value.

This chapter reviews the literature on the various forms of capital that generate value. It does so from a viewpoint that moves beyond the linear or normative perspective of how each individual form of capital can be leveraged for success. That is to say, it views knowledge and knowledge assets, such as human, social and organisational capital, as collectively constructed, a social good and integrated—these assets do not generate value in isolation.

The chapter is organised as follows. First, we define what we mean by knowledge assets as a form of capital and how they generate value in organisations. Here we focus on know-how as the foundation of other forms of capital. In particular, we support the notion that capital is not merely subject to the strategic freedom of the organisation, as is often portrayed in the strategy

J. Swart (✉) • K. Howard
School of Management, University of Bath, Bath, UK

C. Bowman
Cranfield School of Management, Cranfield University, Cranfield, UK

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and performance literature, but it is essentially a *social good which is relational and contextual in nature*. Second, we review the various types of knowledge assets, which we categorise into human, social and organisational capital. This, in essence, provides a framework for both researchers and organisations to identify knowledge assets. Third, we put forward a detailed case study that illustrates how knowledge in an organisation can be identified using the diagnosis of the forms of capital. This case study of a United Nations (UN) agency also illustrates that each form of capital is a social good and can only add value if it is integrated with other forms of knowledge.

Defining 'Capital' as Value Creating

In this section, we explore the nature of 'capital' before we unpack it into three categories: human, social and organisational. Drawing on Marx (1970), we explain that capital is relational and contextual, and that these qualities of capital need to inform our understanding of knowledge assets. In order to describe the value creation process we first broadly define human forms of capital as *know-how*, which is knowledge gained through experience (Swart 2007). Know-how is the foundation of the various other forms of capital, which have the ability to generate value; this is in contrast to nonhuman resources, which cannot generate value in and of themselves (Bowman and Ambrosini 2000). We also differentiate know-how from know-how in action (see Fig. 12.3). That is to say, the surgeon may know-how to perform a life-saving operation but it is only when s/he uses their power to put this know-how into action that any value can be generated. We explore the relationship between capital, know-how and value generation in this section.

In Fig. 12.1, we summarise the value creation process: know-how interacts with nonhuman resources, such as equipment or brands, in Time 1, to produce an output in Time 2. The time lag between T1 and T2 would be months in the case of the assembly of an aircraft, weeks in the preparation of an audit, minutes in the case of a restaurant meal and seconds in a barber's shop. The time dimension is critical and is the source of business risk. The longer the gap between T1 and T2, the bigger the risk that the outputs produced turn out not to be valuable.

In Fig. 12.1, we have the *use values* that interact in the value creation process. Now these use value interactions can occur without the intercession of *exchange value*, that is, money in the process. If you decide to mow your lawn, your mowing know-how combines with the mower to produce a mowed lawn as the output. Thus, we can conceive of use value creation processes occurring

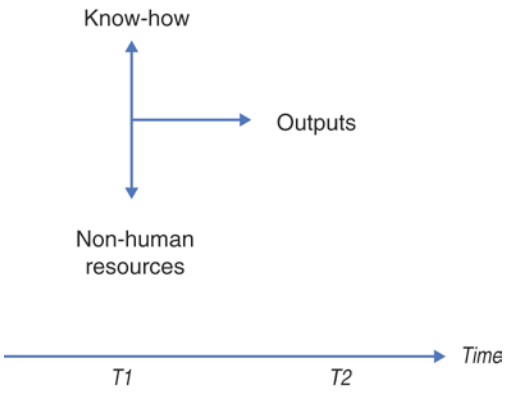

Fig. 12.1 The value creation process

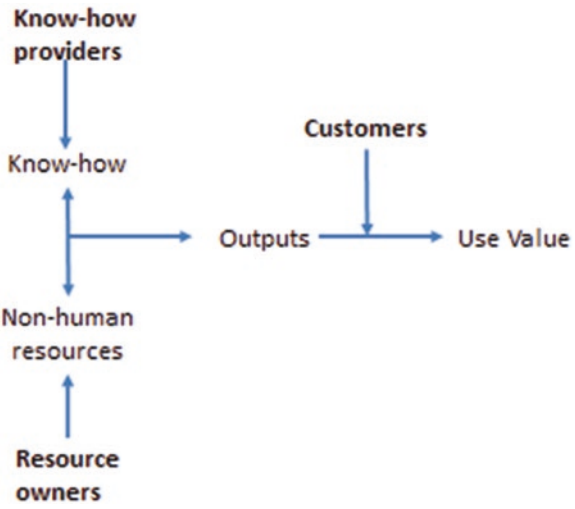

Fig. 12.2 Know-how providers, resource owners and customers

across all forms of organisation from clubs, societies, voluntary organisations, charities, public service, armed forces and, of course, value creation in private-sector firms. Is it correct to apply the term 'capital' across all these contexts? What is missing from Fig. 12.1 are the people who supply these use values and consume them.

In Fig. 12.2, we add in three groups of people: the people who supply the know-how (e.g., staff), the people who own the nonhuman resources and the customers. First, customers determine whether outputs are use values. If customers do not like what is produced, if they do not consider the output to be good 'value for money' then they will not buy it. Thus, one aspect of value

creation is customer perceived value. We can use the economist's concept of *consumer surplus* to explain customer value. Consumer surplus is the difference between what the customer is willing to pay for the good, less the price charged. The more consumer surplus that the system produces for an individual and for consumers in aggregate, the more value is created.

But we can extend this notion of consumer surplus to the consumption of other goods which are not bought but are nevertheless valued. Public services, the armed forces and charities can all be considered to be providing use value to the beneficiaries or recipients of these services. The difference is that the beneficiaries do not pay directly to acquire the services. But the beneficiary's subjective appraisal of these services is directly comparable to 'willingness to pay'.

We now consider the owners of nonhuman resources, such as buildings, machinery, computers, patents, software, brands and information. In the case of public services, the 'owners' could be the state or the local authority. In the case of a partnership, the owners would be the partners, and in the case of a mutual, for instance a building society, the owners are the customers. For firms, the owners are the shareholders. This then raises issues about the *relationships* between customers, owners and the suppliers of know-how.

When you mow your lawn, you are the know-how supplier, the owner of the mower (and maybe the lawn) and you are also the customer, insofar as you want the lawn mown. In the case of the partnership, the nonhuman resource owners will also be the providers of know-how.

In Fig. 12.3, we have added in the relationships between know-how providers, customers and resource owners.

Marx's explanation of how capitalism works focuses on these relationships. What distinguishes capitalism from earlier forms of social production is that *labour power* (or know-how) becomes a commodity (Malaith and Postlewaite 1990). In the archetypical cotton mill of the nineteenth century, the workers sold their know-how (labour power) to the capitalist in return for a wage, the rate of wages being the outcome of the dependence relationship between the mill owner and the 'knowledge' worker. The bigger the supply of unemployed labourers, the lower the wage rate.

The labourers work with the spinning jennys and the steam engines that drive them to produce cotton thread, which is sold on to the cloth makers. The purpose of the enterprise is not the production of cotton thread; it is the production of profit. Marx uses the term *capital* to refer to the *social relationships* between the worker and the mill owner (link A in Fig. 12.3). The ownership of the means of production, in this case the mill building, the jennys and the steam engine, gives the mill owner power over the worker. Due to the

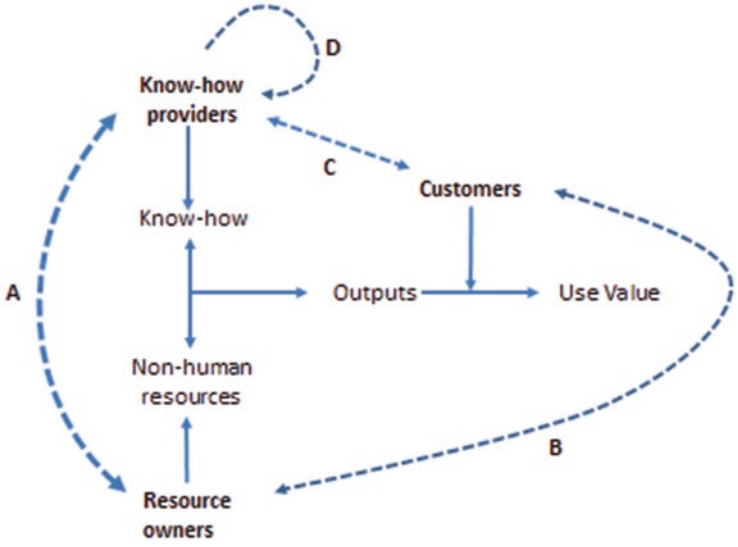

Fig. 12.3 Social relationships in the value creation process

massive increase in productivity afforded by steam-powered spinning machines, it is not possible for the worker to be productive using the old technology, the spinning wheel. She must access the more productive equipment, but access is controlled by the mill owner. This sets up the social relationship between mill owner and worker.

For Marx, this social relationship plays out through two forms of capital: fixed or *'concrete' capital*, that is, the machines, and *variable capital*, the labour power of the workers. The value of concrete capital is not determined by how much the machine cost when it was bought, or how much it could realise if it was sold. Its value is contextual and relational. This value consists in the relationships between the machine, the know-how that works with it and the value that customers place on the outputs. Thus, the value of concrete capital (the nonhuman resources) will vary as these relationships change. The value of labour power (variable capital) again is relational and situational: its value is a function of how much profit (surplus value in Marx's terms) it can produce. Marx argues that machines embody 'dead labour', the past labour expended by the workers who made the machines. This 'locked-in' value can only be realised (valorised in Marx's terms) by living labour working with the machine. And value is only created if customers buy what is produced. Thus, the value of different forms of capital is both relational and contextual.

Human Capital and the Resource-Based View

The resource-based view sets out to explain why some firms are able to sustain flows of super-normal profit through the possession of 'resources' that are valuable, rare and inimitable (Barney 1991). It seems that part of the conversation about human capital is an implicit recognition of this variability in the quality of employees.

The terms human, social and organisational capital seem often to refer to *differentiated* assets and capabilities that deliver more value than other 'standard quality' resources. These forms of capital enable a firm to be more productive, effective and efficient than either rival firms, or than how the firm would perform if it did not possess them. The search for these sources of extra performance has unfortunately encouraged the piecemeal and compartmentalised approach that we argue against. Thus, we have 'talent' being identified and executives capturing startling levels of remuneration. If capital is relational and contextual, it makes little sense to try to tease out single components from this complex web of interactions and attribute system performance to them.

In Fig. 12.3, we have depicted other relationships between the actors in the system. The relationship between resource owners and customers is important (link B). In most firms, there is no direct contact between owners and customers. Instead, the relationship is mediated via the products produced. In simple terms, the more we can charge for the products produced, the more revenue enters the system. But the flow of profits is the resultant of revenue inflows and cost outflows. Thus, the bargaining relationships between owners on the one hand, and employees and suppliers on the other (link A) will determine the flow of costs, and ultimately the flow of profits (Bowman and Ambrosini 2000; Coff 1999).

In many professional service contexts, the employees have direct interactions with customers (link C). But sales people from most firms will have relationships with clients and customers and these can be critical in securing and sustaining a flow of orders.

In Fig. 12.3, loop D represents the relationships among know-how providers. These interactions are critical to the value creation process. More formally, they refer to the 'division of labour' and how coordination is achieved, but they also refer to affective relationships, such as team bonds, morale and so forth.

Non-Profit Organisations

In Fig. 12.3, we represent the typical relationships in a profit-seeking firm. In Fig. 12.4 we have adapted the figure to represent the not-for-profit context, which is important for the case study that we present later in the chapter.

The differences are that beneficiaries and users, such as refugees, replace 'customers', and funders and donors replace resource owners. The relationships between the actors in the system are different to the firm context and we would suggest that, as a consequence, using the term 'capital' to describe any of these relationships would seem inappropriate.

However, there is value in exploring the linkages. For example, the links between the funders and know-how providers (A) can be challenging: Funders do not like to see not-for-profit organisational bosses getting paid 'too much' or their donations being wasted on administration costs. Link B represents the beliefs that funders have about entire countries or groups of beneficiaries, their 'worthiness' to receive aid or support services (including knowledge), and what the funders think they need. The beliefs about the needs of beneficiaries held by funders may be at odds with the beliefs of the beneficiaries and the beliefs of those providing the services, who through direct contacts (C) form a different view of what 'value' means to the refugee, rural farmer or war widow.

What we get from Marx is the understanding of capital as a *relationship*, not an amount of money, nor a piece of equipment. As a relationship, capital is therefore fluid and contextual. Its value will vary as relationships between resource owners, employees and customers change. These assumptions form an important foundation for our definitions of the various forms of capital. That is to say, we have first defined the nature of capital and we will now move forward by deconstructing the aggregate notion of 'capital' into its constituent

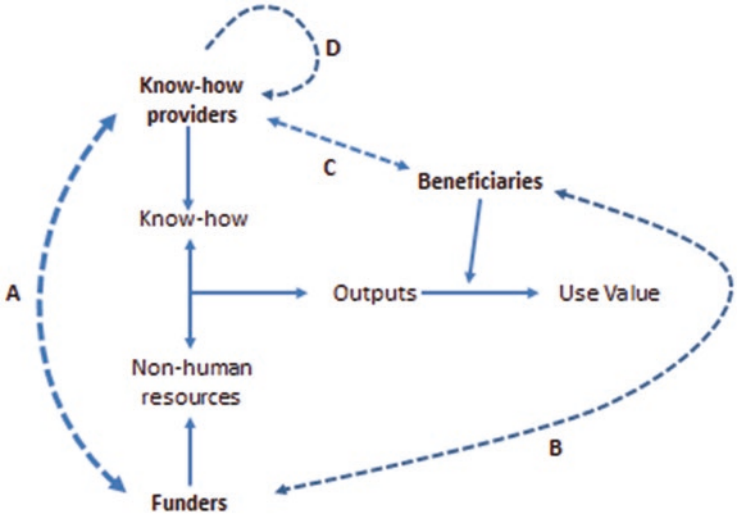

Fig. 12.4 Value creation in not-for-profit organisations

parts. Figures 12.3 and 12.4 enable us to situate different forms of capital in a relational frame, and we use this in the rest of the chapter. In essence, we take the following position: Know-how is embodied by individuals (human capital), collectives (organisational capital) and in knowing how to relate (social capital).

Identifying the Forms of Capital

In order to establish clear linkages to the main forms of capital that we define later in the chapter, we put forward Fig. 12.5, which depicts the interrelationships between know-how, nonhuman assets and outputs.

Human capital refers to know-how, which creates value when it interacts with nonhuman resources. Organisational capital refers to all nonhuman resources but specifically to *codified* knowledge in the form of routines, processes, systems, patents. This has been referred to as *mechanistic* organisational capital. Mechanistic organisational capital exists separately from people, and it only creates value when it is 'valorised' through know-how in action. Mechanistic organisational capital is effectively owned by the firm's shareholders, and can be withheld, moved and controlled by them or their managerial agents. Organic or tacit organisational capital has different qualities. It consists in the specific interactions and relationships between employees.

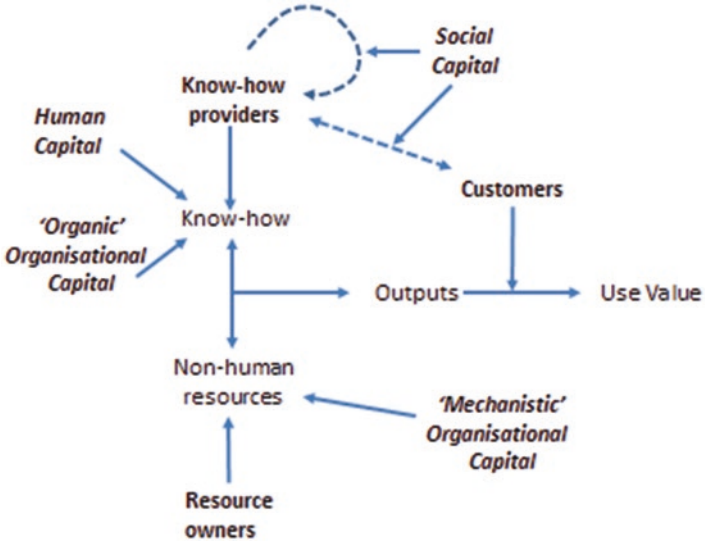

Fig. 12.5 Different forms of capital

Organic organisational capital is manifested through specific interactions and enactments of emergent tacit routines. Therefore, it is not amenable to direct control by managers. Organic organisational capital is thus a form of collective know-how in action, as depicted in Fig. 12.5.

Social capital consists in relationships between know-how providers, and between know-how providers and customers. We now expand on these three forms of capital: human, social and organisational.

Human Capital

Human capital (HC) theory (Becker 1964) uses economic approaches to study how individuals invest in skill development (schooling, training, firm-specific knowledge crafting). The development of HC has been associated with career choices (decision to work, switching employment, labour mobility or be self-employed), career advancement (Chattopadhyay and Choudhury 2017; Harris et al. 2015), performance (Groysberg 2010; Groysberg and Lee 2009; Groysberg et al. 2008; Huckman and Pisano 2006) and other work characteristics (wages, reservation wages, hours of work) (Gimeno et al. 1997: 754). According to this theory, individuals choose opportunities that maximise the economic and psychological value (e.g., satisfaction) that they can generate over their lifetimes (Wright and McMahan 2011). Lepak and Snell (1999) also argue that HC theory emphasises the labour cost relative to the return on investment (i.e., future productivity) for developing employee skills and knowledge. As indicated earlier, the value that individual HC can generate would be a factor of the interaction with nonhuman assets (such as an accountant using a software system to produce client solutions) and the perception the consumer has of the product or service produced.

Human capital is mainly viewed as an *individual level construct* (Bontis 1998; Davenport 1999; Kang et al. 2012; Pennings et al. 1998; Wright and McMahan 2011; Zucker et al. 2001) and it is thought as comprising know-how or the knowledge, skills, intellect and talent of individuals that will be owned by the individual. This know-how is what is hired by the employer. Marx refers to this as labour power, but it can only create value when it is put into action with other assets and know-how. For example, Pennings et al. (1998: 426) state that HC of a professional services firm is the knowledge and skills of its professionals that can be used to produce professional services. If we compare this to the earlier relational approach to capital that we reviewed (Figs. 12.3, 12.4 and 12.5), then HC is know-how, which is owned and supplied by know-how providers.

There are, however, exceptions to this approach that emphasise the relational aspect of know-how discussed earlier. That is to say, one can think of the construction of knowledge as essentially a process located at the level of an individual, but it is mainly derived from social interaction (learning together) and therefore has a collective property, that is, knowing how to act in a team. Examples of such work include Swart and Kinnie (2010) and Chillemi and Gui (2001), who advocate that HC exists at a collective level, such as in a team. HC is therefore seen not as specific to the firm but to a 'network of workers' (Malaith and Postlewaite 1990).

The literature on HC makes clear distinctions along the dimensions of its *specificity*. That is, HC is seen as either generic or specific to a context—firm, client or industry. Lepak and Snell (1999: 33) argue that two dimensions—value and uniqueness—are ubiquitous dimensions that differentiate most, if not all, human capital. The concept of uniqueness represents the degree of firm specificity of the HC.

First, generic HC can easily be transported across firm boundaries. This could, for example, refer to in-house legal counsel, which can be transported across various industries. In this context, generic HC is also referred to as component knowledge (Tallman et al. 2004), a specific body of knowledge that is transferable across organisations. The transportable nature of the property is mainly due to its explicit nature; in other words, it is a formal body of knowledge which can be applied in a variety of contexts. According to HC theory, the individual, being the owner of know-how, would invest in the costs of generic HC development. Thus, generic HC can create value across many firm contexts.

In contrast, firm-specific HC is unique; it cannot be transferred across firms, is context-specific and is therefore thought to be extremely valuable to the firm (Huckman and Pisano 2006). To be precise, firm-specific know-how could feasibly be transferred from one firm to another, but it would not add value in this new context. In this way, the firm-specific quality of know-how is not a function of is tacitness; rather, it is a function of its restricted ability to create value outside a specific firm context.

The resource-based view literature argues that HC resources constitute the main source of sustainable competitive advantage (Delery and Roumpi 2017). This type of HC is valuable in a specific context, and tacitness would render it inimitable. But if it is genuinely firm specific, there would be little point in a rival firm seeking to reproduce it. Thus, while firm-specific HC is valuable, it has no value outside of the firm, because the value of firm-specific HC consists in the relationships between this know-how and complementary organisational assets and resources.

The organisation generally invests in the development of firm-specific HC due to the fact that employees forego employability opportunities. Raffiee and Coff (2016: 766) state that, in theory, firm-specific skills (less valuable externally) create a gap between employees' value in their current job and their next best alternative. This is because their know-how is tied into firm-specific processes. In Marxian terms, this illustrates that the producers of know-how do not always hold the power in the value generation process. The very generation of firm-specific HC can be used as a strategy to retain key knowledge workers (Coff 1999; Swart et al. 2003), thereby enabling the owners of nonhuman assets to exert more bargaining power over the providers of HC. The focal firm may be able to retain employees with firm-specific HC for less than their value in use (see previous section). That is, employees' next best offer would be lower and the firm could beat external offers and still capture some of the value created (Raffiee and Coff 2016). This additional cost to the employee would therefore require high levels of commitment (Klein et al., 2016) to forego future employability. There are also alternative arguments to this position. Douglas and Tomasz (2014), for example, find that firm-specific HC may facilitate more sophisticated 'gaming of incentives', to the detriment of firm performance.

Research indicates further that firm-specific HC results from idiosyncratic learning processes (Barney 1991; Crossan et al. 1995; Lepak and Snell 1999) as individual knowledge is deployed in the organisation to generate products and solutions. This firm-specific know-how becomes woven into the fabric of the organisation and so is mainly tacit in nature (Polanyi 1966; Tsoukas 1996). In essence, the tacit nature of the know-how is what then maintains the power balance between the producers of know-how and the owners of nonhuman assets. However, other research indicates that firm-specific HC is not an absolute construct but is determined by the perceptions of employees (Raffiee and Coff 2016).

Previous research that focused on a specific context such as professional services firms (Gimeno et al. 1997; Pennings et al. 1998; Sherer 1995; Swart and Kinnie 2013; Tallman et al. 2004) has identified a further form of HC, that is, knowledge that is specific to an occupation (legal knowledge) or to an industry (a corporate lawyer specialising in health care). If we then refer back to Fig. 12.3, the development of industry- or occupation-specific HC is highly contextual. That is to say, a creative director may, for example, focus the development of her team's skills on social media. If, however, the client base shifts from this form of advertising or the clients look to 'social influencers' to shape their advertising campaign, then this industry specific HC will be of little value. The costs associated with the development of this form of capital are

incurred both by the individual (at university), the firm (directing the development) and the industry (as an associate/intern). The knowledge therefore comprises both an explicit body of theoretical knowledge and tacit knowing (know-how in action), developed through the practice of a profession.

Although the specificity of HC has been a widely deployed construct, the value, or value generation, of HC has been referred to on fewer occasions (Lepak and Snell 1999). This dimension, that is, the ability of the firm or the individual to create and capture value from the know-how they generate, is central to the arguments that we put forward earlier in the chapter. In line with these arguments, it is predominantly the inclusion of the resource-based view of the firm (Barney 1991) that highlights the centrality of know-how to value generation in the firm. The key argument here revolves around rent appropriation from HC (Coff 1999). Such an analysis evaluates the sets of knowledge and skills in the firm according to their contribution to the enactment of strategies that improve efficiency and effectiveness. The value of HC can therefore be measured as the ratio of benefits to customers derived from HC relative to the costs incurred in creating it (Snell et al. 1996). The value of HC to the firm would be assessed as the extent to which HC either lowers costs, or generates revenues.

The value of HC is of particular importance when considering its nature in professional services firms, because here a client may often contract with a firm to gain direct access to valuable and specific HC (see also Fig. 12.3). Thus, the value created is strongly determined by the relationship between the specific professional and the client. For example, it is frequently cited that clients form long-term relationships with consulting firms because principal consultants develop expertise that contributes directly to the effectiveness of the client. In other words, the development of core skills may be bought into the firm through the knowledge networks that are available to it. That is to say, the firm draws on knowledge that is external to its own boundaries.

In assessing the value contribution of different forms of capital, we need to bear in mind two key points: (1) due to the complex interactional nature of the value creation process, it is not possible clearly to attribute the value that the system creates to the contributions of any component part of the system, and (2) value *creation* and value *capture* are two distinct processes. Value capture is a function of the bargaining relationships between the actors in Fig. 12.3—that is, the resource owners, the customers and the know-how providers (Bowman and Ambrosini 2000; Coff 1999). Our primary focus in this chapter is on the role of different forms of capital in the process of value creation; how that value is then distributed is another issue outside the scope of this chapter.

The Marxist view of knowledge creation, discussed in the previous section, indicates that the development of individual-level know-how cannot be understood without taking into account the social context (Coleman 1990). Knowledge is partly created through relationships and may therefore be held at both an individual and collective level (Shunen and Paasivaara 2011). In the section that follows, social capital (SC) is reviewed and an understanding of 'knowledge that is embedded in relationships' as well as 'knowing how to relate' is developed.

Social Capital

SC is defined as the resource of social relationships owned by individuals (Xiang et al. 2013) or the goodwill available to individuals and groups (Adler and Kwon 2002; Kwon and Adler 2014). It is thought that SC can be used to explain individual and firm performance (Fonti and Maoret 2016) through the process of leveraging the knowledge that is embedded in networks of relationships (Swart and Kinnie 2013). Therefore, it provides access to resources (Nahapiet and Ghoshal 1998). In other words, SC is seen as the medium through which other 'desired' resources can be made available.

The concept was popularised by Robert Putnam (1993), who likens SC to a 'moral resource'. Putnam (1993) refers to SC as the combination of institutional connections and trust that evolve from unique, historically conditioned local cultures. This valuable resource is therefore embodied in 'networks of civic engagement', within which there is thought to be a connection between the degree of social capital accumulated within a region and its economic performance. That is, where there is a vibrant civil society, there needs to be bonds of trust and reciprocity. This view is thought to be representative of macro-level SC (Brown 2003) and brings together Marshall's (1961) notion of economic vibrancy (external economies of scale) and Thorstein Veblen's (1924) thoughts on how institutions create competitive trajectories of growth and technological innovation by adapting to evolutionary market processes. These characteristics have also been used to provide assurance that SC is indeed a form of capital in the economic and behavioural sense.

Theories on SC vary in their approaches to the *origins* (individual or collective), *functions* (identity, norms, resource access), *structure* (structural density or loosely coupled) and the *relational nature* (e.g., nature of trust) of this resource. In terms of origin (of the relationships), the main differences are between those authors that view SC as an individual construct and others that see it as a property of a collective (such as a project team). Adler and Kwon

(2002: 18) state that SC's source lies in the social structure within which the individual is located. This points to the relationship between the individual and the collective. Bourdieu (1986) further regards the origin of SC as the relations between individuals within specific groups or categories. However, the level at which these relationships are deemed to exist differs widely across the literature. For example, Nahapiet and Ghoshal (1998: 243) advocate that SC is the sum of the actual and potential resources embedded within, available through and derived from the network of relationships possessed by an individual or a social unit. Furthermore, Leana and van Buren (1999) view SC as a resource reflecting the character of social relations *within* the firm.

This raises the question, from an organisational perspective, as to whether SC is situated within the firm or between the firm and external actors. Pennings et al. (1998) extend the boundaries of SC to include supporting relationships with other economic actors, most notably potential clients. Inkpen and Tsang also draw our attention to the differences between intra- and inter-firm SC. Similarly, Adler and Kwon (2002: 19) categorise SC into internal (bonding) and external types of relationships (bridging). The distinction is driven by the choice of boundary; that is, are the boundaries of SC drawn within the team/firm/social unit or do they extend beyond these boundaries? Fonti and Maoret (2016) also refer to *core* and *peripheral* SC, and its impact on organisational performance, to highlight the importance of the boundary conditions of SC. These considerations are of particular importance in professional services firms, not least because social capital that is built with clients or potential clients (also referred to as client capital) may be structurally denser (Burt 1992) than the relationships within the firm. The need to disentangle various boundary classifications of SC is sharply delineated when the functional perspectives of SC are reviewed.

Coleman (1990) argues that social capital is *function specific*. He identifies six functions of social capital: obligations and expectations, information potential, authority relations (which three relate to individual level), norms and effective sanctions, appropriate social organisation and intentional organisation. That is, SC is created to fulfil a specific function. However, SC also sets the context within which other forms of capital interact. Here the contextual nature of SC can be regarded as a function in itself. We illustrate this clearly in Fig. 12.5, where we show that SC is the glue that binds together and integrates HC and it is also the capital that guides how the 'outside' world, such as clients and other stakeholders, generate value from the knowledge and skills. That is, SC *enables* HC in the value creation process.

The literature also identifies several other functions of SC. First, it is regarded as a means of enforcing norms of behaviour among individuals or

corporate actors and thus acts as a constraint as well as a resource (Walker et al. 1997). In a similar vein, Xiang et al. (2013) regard SC as being similar to a shared mental model that directs the behaviours of a group. As norms of behaviour are enacted, SC builds identity (Nahapiet and Ghoshal 1998; Orlikowski 2002). SC is therefore seen as the context within which a 'sense of belonging' is created.

Another view of the function of SC is that it provides a context for 'transactions' and that 'what is transacted' across the networks of social ties varies (Putnam 1993; Robinson et al. 2002; Teachman et al. 1997). Adler and Kwon (2002) state that SC enables goods and services to be exchanged for barter or money. They argue further that in order to understand what is transacted one needs to identify whether the focus is on market, hierarchical or social relations, as each type of relationship will influence the nature of the 'transaction'. Regardless of the nature of the relationship there are three main benefits from 'transacting' across SC. These include (1) information access benefits, (2) power benefits and (3) solidarity (enabled through social norms).

Bouty (2000) and Zucker et al. (2001) argue further that exchanges across social relations are much more strategic and that academic researchers, for example, will develop relationships for the particular purpose of an exchange of information. This is also linked to the SC of star performers, where networks are used strategically to access employment opportunities (Olroyd and Morris 2012).

The literature on SC further differentiates with respect to the structure of networks of relationships (Nahapiet and Ghoshal 1998). The literature refers to two contrasting views (Reagans and Zuckerman 2001): the *closure perspective* (Coleman 1988, 1990) and the *structural holes* perspective (Burt 1992). The closure perspective advocates network density or strong ties (Fukuyama 1995) that are characterised by frequent communication and strong emotional bonds between members of a network (Burt 1992; Granovetter 1973; Marsden and Campbell 1984). This correlates with the idea of a dense and rich social community that Putnam (1993) introduced.

The structural holes approach values network disparateness or weaker ties across a network (Granovetter 1985). The focus here is more on boundary-spanning activities and brokerage opportunities (Burt 1992). An important quality of the structural holes approach is that of diversity of knowledge. That is, individual members will use the awareness of their own knowledge sets to build relationships with a group of networks, thereby enabling knowledge renewal in their network.

It is important to note that these structural configurations are not mutually exclusive. For example, the structural density perspective is regarded as most

effective at the intra-organisational level, while the structural holes approach delivers maximum benefits at the inter-organisational level (Reagans and Zuckerman 2001). This illustrates that it is important to be sensitive to the boundaries of SC.

The final dimension along which the various SC approaches differ is the *relational dimension*, which includes consideration of the types of trust, norms and values embedded in the relationships. Nahapiet and Ghoshal (1998) also advocate that the relational dimension of SC is influenced by the historical development of interactions. The particular dimensions that are important in their analysis of the relational nature of SC include trust, norms and sanctions, and obligations and expectations.

Leana and van Buren (1999) also divide SC into *fragile* and *resilient* trust and *generalised* and *dyadic* trust. Fragile trust is believed to need reciprocal exchanges (give and take) for the relationship to last, whereas resilient trust is developed over time and is guided more by the norms of behaviour in the social unit than an actualisation of equal exchanges. Dyadic trust requires knowledge of and contact with another actor, while generalised trust pertains to the social unit as a whole, rather than to specific actors.

Kang and Snell (2009) integrate the dimensions of the structure of the network and the type of trust embedded in these relationships to identify two types of SC. *Entrepreneurial* social capital is based on loosely connected and structurally weak networks where the actors rely on direct contact and detailed knowledge of one another. For example, a creative professional in a marketing agency will draw on people inside and outside the firm whom they know and trust when faced with a novel client request. *Cooperative* social capital involves tightly coupled, strong, dense networks, generalised or institutional trust and shared understanding of how knowledge is combined. Here, two management consultants working for the same organisation will cooperate even though they may not know each other that well—in other words, their trust is based on the institution and its culturally derived practices.

In their review of the development of SC research, Kwon and Adler (2014: 413–415) further identify the importance of the cognitive dimension of SC. This essentially has two aspects. First, the perceptions and representations of the network of relationships in the minds of the individuals. This is of particular importance to our case study, where a global network of individuals, such in as in a United Nations agency would need to draw on their SC by acting on the representations of SC in their mind/perceptions. Second, SC has a cognitive or knowledge dimension in and of itself. Kogut and Zander (1996), in his seminal article on the network as knowledge, addresses the notion that the value of the firm derives from participation in a network. His

reasoning of what a firm is rests upon three central ideas: the unit of accrual, the governance structure, and the coordination of capabilities and social identity. Through this work we are urged not only to extend our empirical research beyond the boundaries of the firm but also to pay attention to the way in which knowledge, at the industry level, will have an impact on the structure of the network (410). This view on networks uses knowledge to define boundaries and to structure identity. In this way, SC as networks constitute capabilities that augment the value of firms (423). With reference to our earlier discussion, Kogut and Zander (1996) point to the interrelationship between *function* (access to collective capabilities) and *form* (network membership and structure) but they do not address the notion of knowledge *as* a network. The interrelationship between SC and knowledge transfer has been discussed in detail by Inkpen and Tsang (2005, 2016). In summary, their original and review articles draw together the notions of the interrelationships between network structure (as a conduit) and knowledge transfer (as the properties that are transacted across the structure).

These variations point to the need to consider the dimensions of SC as contextual and integrated. That is to say, we cannot think about SC as a knowledge asset by only considering the structure of the relationships or which benefits are derived from these relationships. In contrast, we need to consider origins, functions, structure and relational content in unison when understanding how, in both theory and practice, SC can generate value within and across organisations.

Thus far, we have reviewed know-how in action (HC) and the specific structural and relational contexts within which HC is situated (SC). It is clear from both literature and empirical research that in order to generate value within and across firms, both human and social capital will be influenced by and interact with processes or embedded routines within the organisation. This form of capital is frequently referred to as organisational capital and is the focus of the following section.

Organisational Capital

Organisational capital (OC) is defined as the knowledge embedded in institutionalised structures, processes and routines in the organisation (Bowman and Swart 2007; Fu et al. 2016). One of the most important characteristics of this resource is that it is the crystallisation of individual interactions and routines over time which become 'solidified' at the organisational level (Fu et al. 2016).

OC takes two forms (Kang and Snell 2009; Youndt et al. 2004). *Mechanistic* OC is related to codified knowledge which is then leveraged through organisational structures, systems, databases, manuals and patents. Kang and Snell (2009: 70–71) refer to *organic* OC, which focuses on the informal aspects of organisational life as expressed in know-how and tacit routines (Bontis 1998).

The notion of knowing what to do at the organisational level includes organisational tacit knowledge, which is thought to reside within the organisational routines or rules (Ambrosini and Bowman 2001; Nelson and Winter 1982; Winter 1987). It is these very routines that enable the integration of other knowledge assets. That is to say, what we know (HC) and how we relate (SC) are often driven by how we act and the routines available to us (OC).

The view that OC is situated within tacit organisational routines focuses on the informal aspects of organisational life. That is, the *cultural dimension* of an organisation which is often expressed as 'the way we do things around here' (Purcell et al. 2004).

The cultural dimension of OC plays an important role in the creation of knowledge-based outputs. An organisation with strong OC will have a supportive culture that allows individuals to learn and unlearn (Bontis 1998: 66). In this light, high levels of OC have been linked to ambidexterity (Fu et al. 2016; Turner et al. 2016). This view of OC does of course support the explorative mode of learning (Crossan et al. 1999), which advocates experimentation, research and development and innovation.

Ambidexterity is, however, inclusive of exploratory and exploitive learning (Crossan et al. 1999) and it is therefore important that the OC can support both modes of renewal and innovation; that is, the use and application of knowledge and processes familiar to the firm. The issues of fit and flexibility (Lepak and Snell 1999) are thus important when considering the cultural dimension of OC, and it could be an oversimplification to advocate one type of culture as suitable to the transformation of HC into intellectual capital.

Integrating Forms of Capital to Generate Value: Theory and Case

The relational nature of capital would suggest that attempts to disaggregate the components of capital, identified here as human, social and organisational capital, and to deal with them on a piecemeal basis would be a mistake. Their value as standalone components is minimal, and can in fact be determined if the component were to exit the system; for instance, when the employee leaves, relationships break down or processes are no longer appropriate.

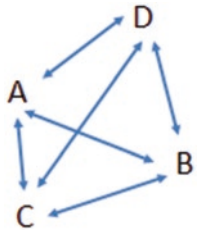

Fig. 12.6 Component interrelationships in a value system

In Fig. 12.6, A, B, C and D represent components in the firm's value system. If we take the example of a pharmaceutical firm, A and B might be particular relationships with clients and drugs testing authorities (social capital), C is powerful laboratory equipment (organisational capital), D a leading scientist (human capital). The value of this system consists in the *arrows* not the *nodes*. This representation clearly illustrates the folly of decomposing the system and considering the parts, without reference to the whole. Similarly, if we change one component, A, this necessarily affects the interactions with B, C and D. Moreover, the presence of A will likely have moderating effects on, for example, the links between B and D. The system is complex and open; we need to incorporate customers and suppliers, and society at large into this picture, as these will all impact the value created by the system.

In the section that follows, we build on Figs. 12.4 and 12.6 to illustrate how the knowledge assets that we identified earlier—that is, human, social and organisational capital—interact to generate value.

UNCDF: A Case of Knowledge Identification and Integration

> My view on knowledge is that we have to have a course where we can interact. It's not about activities or ticking the box, but out of those activities where is the forum or space where we go out in a broader way, and say this is what we've done, or this is what we've learned, and put it forward, and get views towards us. And you know, there might be good, bad and ugly things we do every day, every week, every month, so out of the good, bad and ugly we need to have a space of interaction. It can be a working group interaction, it can be a one to one, it can be any sort of interaction. (UNCDF employee interview, January 2016)

The focus of our case study is UNCDF (United Nations Capital Development Fund).[1] UNCDF is of particular interest to our discussion in this chapter on account of both its global networked span and its focus on developing value by creating public social goods in society as a whole. This organisation has considerable experience in implementing knowledge management since 2009. The way in which we present the case study is as follows; (1) first, we refer to the identification of key knowledge assets, then (2) we illustrate how these assets are understood in the context of the IC model (Fig. 12.6), and in (3) the contextualised framework that UNCDF uses for developing collective competencies and strategic value. The case illustrates how knowledge activities alone, or an emphasis on a single capital, such as HC, are insufficient to develop intellectual capital, or even a culture of knowledge-sharing and collaboration, unless such activities are framed as relational to create value via collective competency. Although much emphasis is placed in organisations on developing individual talent, this case suggests that optimal value for beneficiaries and users, as well as enhancements in organisational performance, are more likely to be achieved by focusing knowledge management on collective competency strengthening.

UNCDF is a 150-person organisation split into two practice areas. The Financial Inclusion Practice Area (FIPA), which forms the basis of this research, comprises some 50 people spread across 14 geographical locations. These UNCDF sites are located in the poorest and hardest to reach markets in the world, owing to UNCDF's strategic priority on least-developed countries (LDCs) and support for LDC advancements on the Sustainable Development Goals (SDGs). These sites span global time zones and include countries such as Bangladesh, Sierra Leone, the Democratic Republic of Congo, Ethiopia, Swaziland, Malawi, Nepal, Myanmar, Cambodia, Papua New Guinea and many Pacific Islands. FIPA supports governments and the private sector to expand financial inclusion by developing:

- targeted financial investments in underserved sectors such as youth, rural and agriculture;
- market growth in areas such as clean energy and digital finance;
- favourable market conditions for developing a domestic entrepreneurial class;
- targeting products for the most vulnerable and excluded, such as women without bank accounts, small rural farmers and social welfare recipients.

As well as being geographically dispersed, knowledge in FIPA is concentrated in high-level posts, not evenly distributed across posts or projects, creating a

crater-like knowledge ecology. During its first formal phase of knowledge management (2010–2014), FIPA self-evaluated that while project-level KM had evolved, knowledge continued to be very uneven and siloed. Moreover, knowledge had become concentrated into knowledge products (outputs), in some instances weakening overall strategic outcomes—what we refer to in this chapter as use value (see Fig. 12.3), and taking a resourced-based view of the organisation. Paradoxically, while external knowledge-sharing improved, internal knowledge-sharing stagnated. Staff highlighted a lack of knowledge incentives and rewards, and managers realised that an imposed KM from top-down only yielded short-term results, not the long-term embeddedness that they knew was needed.

Knowledge Integration at UNCDF

This case study was conducted during the drafting of UNCDF's knowledge management (KM) framework (2017–2021). The organisation identified five knowledge assets crucial to performance in FIPA at UNCDF. Individuals made only scant reference to expert technical and professional knowledge, confirming accumulated know-how, or capability, as the foundational knowledge assets in the context of UNCDF-FIPA (see Table 12.1). Employee perceptions of the strength of knowledge assets (importance as compared to competence) are also detailed in Table 12.1.

FIPA employees perceived themselves as strongest in knowledge assets that rely more on intrinsic motivation, that is, those capabilities associated

Table 12.1 Employee ratings out of 10 on the importance and competence in knowledge assets

Knowledge assets	Importance	Competence	Gap factor (%)
Business acumen and agility (clinching deals, successful engagement with donors)	8	4.8	32
Leadership (stewardship, achievement, strategic direction and guidance)	7.3	5	23
UN know-how (of the UN system)	6.2	4.5	17
Product design and project management (pipelining)	5.4	4.8	6
Relationship and context management (situational)	5	6.9	19

more closely with individual HC, such as project management. Conversely, employees perceived their performance as weakest in the areas of business acumen and leadership, both of which require greater mobilisation of relational networks and external factors for their accomplishment. This emphasises, as does our interviewee quoted at the start of this section, that know-how providers (see Fig. 12.5) in this context rely and draw strongly on knowledge across networks to augment their capability Kogut and Zander (1996). Already at the asset identification stage, a strong indication emerged that SC, the glue that binds HC, made a significant contribution in galvanising human and organisational capital in this context. For example, Adler and Kwon's (2002) concept of bonding is clearly inferred in the relational aspects of leadership stewardship and guidance referred to in our case, as is the concept of bridging during deals and engagement with donors and partners.

The foundational function of SC in supporting knowledge assets at UNCDF was further elaborated by one employee when explaining how to go about working relationships with government officials in his country:

> Basically, before you go to meet any Secretary, I think you need to know very basically, the political context where they come from, and the cultural or behavioural aspect. Like what they like to listen, what they don't like to listen, how do they behave, how do they act, there are some cultural issues, for example in this country there is no culture of saying 'no', it's a very Asian culture but we are very prominent on that. 'No' is kind of very irritating, or even kind of, how do I put it, when you say 'no' to something that's the end of everything. That means from tomorrow we are not going to discuss or talk. So these are very key and critical cultural or behavioural things

Table 12.2 details how each of the UNCDF knowledge assets relates to the human, social and organisational capital. This analysis highlights how almost all the knowledge assets, as defined by employees, include each form of capital. That is to say, what an individual or an organisation knows cannot be situated *only* within one form of capital. For example, knowing how to lead would draw on individual know-how (HC) but it would rely on relationships (SC) and it would be contextual (OC). This is an important point and illustrates how fundamental the Marxian view to capital is, that is, relational and integrative. As Table 12.2 illustrates, UNCDF-FIPA employees were all too aware that mobilising knowledge assets required the mobilisation of OC and SC in favour of HC.

Table 12.2 UNCDF-FIPA knowledge assets according to the intellectual capital model (Swart 2006)

Intellectual capital	Business acumen	Leadership	Relationship and context management	UN know-how	Product design and project management
Human capital	Negotiation and brokerage skills, pitching and communication skills Identifying and optimising opportunities Engaging donors	Integrity and perseverance, serving others Fighting for achievement Advanced professional expertise in FI and areas such as digital	Self-awareness, motivation, interpersonal skills, attitude and style Managing connectivity and interdependence with others		Research know-how, scoping, exploration and analysis
Social capital	Effective and strategic partnership building	Fostering inclusiveness, openness, reflection and employee engagement. Stewardship of multi-stakeholder fora	Cultural awareness and adaptability	UN relationships	
Organisational capital	Developing innovation Know-how of institutional communications	Sustaining a culture of learning, collaboration and organisational development Developing strategic horizons across thematic and organisational priorities such as digital and women	Tracking and management of many organisational relationships simultaneously Collaborative practices	Know-how of UN routines and procedures, such as procurement Understanding organisational requirements and meeting (UN) needs	Product pipelining and project and data management Accountability and reporting

Specifically with regard to leadership know-how, employees observed a need for socialisation—'[w]e already have strong executive management, we need to trickle this down to the regional teams, and specialists'—and routines:

> We need, (1) Ongoing interaction and being part of programme processes and discussions. (2) Being part of missions/meetings and interactions with external stakeholders. (3) More flexibility in difference of opinion and ways of implementing things to achieve the desired results. (4) Making one, and acknowledging within the institutions, an expert on a specific subject or process etc. This creates a pool of leaders on various aspects. In my years with UNCDF there has never been any leadership training.
>
> We need clear messages by management on how it wants the leadership style to be and that it actively supports that leadership/management style. Secondly, their presence and guidance: we have very good senior line management in FIPA and they have a lot to share, teach and participate for the benefit of people on the ground.

In the area of know-how collaboration, the gap between individual willingness and collective capability highlights the challenges associated with leveraging know-how for value generation in a globalised context. In the organisation, there was a general view that knowledge-sharing within UNCDF-FIPA was good. However, there was a sense of frustration with limited mechanisms (OC) to enable knowledge-sharing: a 'culture of cooperation and joint objectives or synergies between programs should be part of UNCDF. There is no institutionalized way of sharing knowledge. We do when needed.' Further:

> Knowledge-sharing, cooperation and building relationships and partnerships is a strong point within FIPA, but is somewhat hampered by geographical and topical distance (the latter: I focus on my work in this country, you do something else that is your work, and I don't know what it is, or if I do to some extent, but don't know exactly what that is nor how easily I could leverage your knowledge).
>
> We need to learn "from those who do well within FIPA. Learning from successful business managers that are our partners. In both cases explicit sessions or meetings should be organized for the purpose.

Finally, consistent with the significance that some scholars have placed on identity and collective mindsets as a functional component of SC (Kwon and Adler 2014; Nahapiet and Ghoshal 1998; Orlikowski 2002), we found the

networked nature of UNCDF-FIPA led them to call for more opportunities to develop their sense of themselves via shared in-person experiences (not webinars), whether this was retreats or specific practice sessions in pitching UNCDF-FIPA distinctiveness.

With the above analysis in mind, and in order to move from a fragmented and distributed landscape to an integrated knowledge management ecosystem, UNCDF-FIPA's KM framework (2017–2021) set out to develop a set of collective capabilities in support of their strategic goals. These are summarised in Table 12.3.

The above case study illustrates the importance of (1) the identification of knowledge assets and (2) that value can only be generated when these assets are integrated. That is to say, particularly organisations such as the UNCDF, that rely on knowledge (HC) to generate solutions that have an impact on society, need to integrate their various knowledge resources. By paying attention to the identification of knowledge assets, we illustrated that UNCDF-FIPA has made great progress in this identification process. We are reminded here of the famous quotation of Jerry Junkins: *If only Texas Instruments knew what it knows*. Such identification is therefore the first critical step in knowledge integration. Second, we illustrated the challenges associated with knowledge integration—that is, the creation of synergistic benefits from the various knowledge assets—and showed the importance of SC and OC in supporting HC in a global organisation working across networked groups.

In conclusion, this chapter first points to the importance of identifying knowledge as a form of capital in Marxian terms, in other words that it is relational and contextual. Second, we reviewed the literature on the main forms of capital—human, social and organisational. The identification of these forms of capital would enable an organisation, and a network, to generate value from the knowledge assets that it owns and that it has created. Third, we illustrated how that value, such as products, services and solutions, cannot be generated if the constituent knowledge assets (forms of capital) are not integrated. We put forward a case example of a UN agency to illustrate the importance of the identification and integration of knowledge assets.

Table 12.3 Knowledge integration in a global organisation

Intellectual capital	Collective competency developed	Activities	Performance outcomes (i.e., impact of knowledge integration)
Human capital	Synergy between individual learning and organisational learning Partner and donor capability	Cross-boundary coaching and training Retreats and cross-boundary workshops Development of detailed knowledge roles Introduce behaviours for collaboration Coaching workshops in pitching/selling, donor dialogue Uniform approach to communicating results	Personal development Improved delivery enabled by collaborative learning across various thematic and geographic areas Increase in donor attraction and satisfaction
Organisational capital	Close fit between perceived and actual knowledge sharing Overarching quality framework Capacity to align cross-boundary thematic work	Retreats and cross-boundary workshops KM team and communications KM platforms (e.g., Yammer) KM competition Development of a WhatWorks framework Cross-project sharing	Accelerated know-how capability Incentivised KM culture
Social capital	Employee engagement via relationships Recognised leadership in FI sector through knowledge sharing and engagement	Staff internships Retreats Coaching and workshops in stakeholder management and leadership Retreats/events with stakeholders	Cross-boundary linkages Improved motivation Cross-project relationships offering mutual support Improved stakeholder engagement and satisfaction levels

Notes

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13

A Gender and Leadership Perspective on Knowledge-Sharing

Memoona Tariq

Introduction

Knowledge is a critical organisational resource that may provide a sustainable competitive advantage in a dynamic environment (Jain and Mnjama 2017; Wang and Noe 2010). To gain a competitive advantage, it is vital for organisations to have a team of diverse leaders, particularly women, who are capable of competing successfully in a globalised world (Wang and Noe 2010). Leaders are known to play a key role in managing and disseminating knowledge and in how they can affect knowledge-sharing directly or indirectly (Jain and Mnjama 2017). Organisations that are knowledge focused may benefit from having a diverse team of employees and leaders who can share valuable knowledge (Wang and Noe 2010).

Knowledge-sharing is a fundamental means through which leaders and employees can make a significant contribution towards knowledge application and innovation, and ultimately achieve a competitive advantage (Lin 2006). Knowledge-sharing between leaders and employees allows the organisation to exploit and capitalise resources in ways that might not be possible otherwise (Lin 2006). Research (e.g., Chai et al. 2011; Wang and Noe 2010) has shown how knowledge-sharing makes positive contributions towards firms' reductions in production costs, faster completion of new product development, team performance, innovation capabilities and performance. Although knowledge has made a positive impact on organisational approaches,

M. Tariq (✉)
University of Huddersfield, Huddersfield, West Yorkshire, UK

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not much attention has been paid to women and other diverse groups in the context of knowledge-sharing (Ling et al. 2009; Suppiah and Sandhu 2011).

Due to the potential benefits of knowledge-sharing, organisations have begun to invest considerable time and financial investments into their knowledge management (KM) systems, to help facilitate the collection, storage and distribution of knowledge (Rhem 2017; Suppiah and Sandhu 2011). However, despite such investments, many organisations still fail to achieve the competitive advantage (Janus 2016). For example, it has been estimated that Fortune 500 US companies lose approximately lost $31.5 billion per year from employees failing to share knowledge efficiently (Myers 2017). One of the reasons why sharing knowledge fails is due to lack of consideration given at organisational and interpersonal levels (Janus 2016).

The literature alerts us to how women have an impact on leadership (Baporikar 2016; Hislop 2013); however, not much attention has been given to women in knowledge management. The aim of this chapter is to illustrate the importance of female knowledge leaders within organisations. It identifies and reviews how women have a positive impact when it comes to sharing knowledge within teams. It also highlights how the existing organisational structure and culture could be improved to empower female knowledge leaders.

Concepts and Definitions

Knowledge-sharing 'is a two-way multilateral exchange in which the parties learn from each other. Knowledge-sharing is more than communication, because much knowledge in organisations is hard to articulate due to number of reasons' (Janus 2016: 5). Values in knowledge-sharing includes beliefs around openness, supportiveness, trust, learning and freedom among the leaders and employees (Jain and Mnjama 2017).

Leadership is a 'process whereby an individual influences a group to achieve a common goal' (Northouse 2016: 6). This means that leaders need to have the ability to influence their teams (Singh 2008). In this chapter, the term refers to how leaders could encourage knowledge-sharing among employees through relationship building and recognition of individual contributions (Singh 2008).

Gender refers to the 'socially-constructed roles and relationships between men and women' (Canary et al. 1997: 6). Gender is particularly focused on conceptions of femininity and masculinity between men and women (Canary et al. 1997). It focuses not only on the socially constructed roles but rather the inequalities that exist between men and women in society and organisations

(Acker 2006). Analysis on gender differences often shows disadvantaged and weaker positions for females than males in the social, political, economic, legal and educational environments (Acker 2006).

Characteristics of Knowledge Sharing

Previously, scholars have identified two characteristics used in knowledge-sharing: tacit and explicit knowledge (Gascoigne and Thornton 2013). Tacit knowledge is believed to be highly influential and personal, and difficult to extract in the form of information from individuals in organisations (Gascoigne and Thornton 2013). It is only when individuals/groups come together due to particular circumstances that they are likely to share ideas and develop new insights which helps them to create new knowledge (Jiang and Hu 2015). According to Haldin-Herrgard (2000), the main difficulties in sharing tacit knowledge are related to negative perceptions and language barriers. For example, an individual may not have difficulty expressing and articulating what they know but others may perceive them in a negative manner (Haldin-Herrgard 2000). Another challenge may be internalisation of how tacit knowledge should be managed (Haldin-Herrgard 2000). In today's economy, time is such a scarce resource that it is rarely set aside for sharing knowledge within different departments in the organisation (Okoroafor 2014).

Conversely, explicit knowledge uses formal organisational processes to help individuals articulate knowledge (Janus 2016). In other words, information is disseminated through the means of written documents, drawings, operating procedures and manuals. Basically, information systems have a vital role in facilitating knowledge, either through company intranets or memos (Janus 2016). Explicit knowledge is seen to be more reliable due to the fact that it is formally written and stored for future reference (Jiang and Hu 2015). Zhou and Nunes (2015) argue that without tacit insight, explicit knowledge is likely to lose its meaning. For example, written speech is possible only after internal speech is well developed (Zhou and Nunes 2015). Therefore, both approaches are fundamental for knowledge-sharing and we cannot neglect one or the other.

Knowledge Sharing: The Leadership Perspective

Leaders often face the challenge of transforming the existing culture and mindsets of employees and managers so that they are receptive, supportive and committed to the precepts of knowledge-sharing in organisations

(Okoroafor 2014). Knowledge-sharing encourages exchange and creation, which consequently leads to better team performances in organisations (King 2009). Team members that continuously share information are likely to perform far better in their roles than those that ignore such an approach (Lee et al. 2013).

Despite the importance of sharing knowledge, especially tacit knowledge, it represents a highly personalised approach which is difficult to transfer directly (Lee et al. 2013). Knowledge-sharing process is usually hindered by social relationship factors (e.g., trust, communication), which is a central issue in professional relationship building in organisations (Zhou and Nunes 2015). As a result, social relationships become the most crucial factor that affects the knowledge-sharing attitude and behaviour of employees (Zhou and Nunes 2015). For example, without frequent social interaction and deep trust among employees and leaders, relationship challenges are likely to occur (King 2009). The fact is that knowledge is no longer perched at the top of the organisation but is concentrated far more in the centre (Hislop 2013). As such, knowledge-sharing cannot be managed in the traditional forms, where top management has control of the flow of information (Merat and Bo 2013).

One of the key methods used in developing and sharing knowledge is through networking and actively listening to others (Hislop 2013). Often, knowledge leaders are known to encourage their employees to take an active role when engaging with their personal and professional networks (King 2009). Building professional relationships is crucial as it provides avenues for opportunities and growth for the organisation (Clair 2017). Similarly, Kotter (2012) notes that leaders can only motivate their teams when they are encouraged to cooperate with the organisation's new concepts and strategies (Boondao 2013). Kouzes and Posner (2005) also suggest that this can only be achieved when organisational leaders are prepared to look at the workplace from the employees' perspective—especially those that specialise in knowledge management processes (Clair 2017).

Traditional leadership is mainly focused on the human attributes that are related to task organisational structures, leadership substitutes and the nature of decision-making processes (Zhang and Jiang 2015). Knowledge leaders are focused on enhancing their leadership skills, cooperation and trust, and building knowledge through integration and innovation (Zhang and Jiang 2015). The fact is that as more companies are adopting a culture of openness, firms are actively seeking leaders that can support knowledge building within the organisation (Okoroafor 2014). As a result, traditional leadership is becoming outdated.

However, the major challenge that knowledge leaders face is encouraging employees that have been longer in the organisation but are less inclined to share work knowledge within the organisation (Bordia et al. 2006; Zhang and Jiang 2015). Even though these employees are likely to have greater confidence and expertise on organisational practices, they are far more likely to keep it to themselves (Bordia et al. 2006; Zhang and Jiang 2015). The obvious concern that they have is that they may lose authority or weaken their position if certain information is shared (Carmeli et al. 2011).

Although leaders in organisations are usually in a position to address or overcome resistance, knowledge-sharing in organisations does not come automatically, which means that organisational and team leaders will need to influence the purpose and mechanics of knowledge-sharing (Lee et al. 2013). By building knowledge, leaders can create opportunities and processes that stimulate and encourage knowledge-sharing among the top management and employees (Lee et al. 2013). For example, by offering innovative ideas, challenging technical solutions and stimulating novel approaches to work, leaders can instigate team discussions and reviews, which would lead them to share information within the teams (Lee et al. 2013). By engaging in knowledge-sharing, leaders can only then act as role models within the organisation (Xue et al. 2011). These leaders are signalling towards setting the example that being open and sharing original ideas and information is important and valuable to any organisation that wants to thrive (Xue et al. 2011). Moreover, with the role of modelling, team members may share their expertise and knowledge within the team (Xue et al. 2011). Thus, the expectation is that the stronger the leader's performance is in terms of knowledge building, the greater the level of knowledge within the team (Carmeli et al. 2013).

Previously, knowledge leaders have tried to redesign organisational structure by forming work groups where there is an elevated level of interaction among the individuals (Carmeli et al. 2013). Yet, in almost all organisations, the structural and cultural barriers may hinder knowledge-sharing, as it requires more than just individuals/groups exposing information (Carmeli et al. 2011). In addition to structural solutions, leaders also act as 'agents' who exert power to facilitate knowledge-sharing (Carmeli et al. 2011).

Several scholars (e.g., Boondao 2013; Carmeli et al. 2011; Mukherji and Jain 2009) have suggested that transformational leadership has significant importance for knowledge-sharing because it focuses on one being charismatic, which inspires others. Transformational leaders motivate followers by encouraging them to transcend their own self-interest for the good of the team or organisation (Mukherji and Jain 2009). This enhances team spirit, which cultivates the desire to help other members within

the organisation (Bass and Riggio 2006). Transformational leadership works in favour of women as it was developed from feminine traits (Carmeli et al. 2011).

Knowledge Sharing: Gender Stereotypes

The role and influence of gender in knowledge-sharing behaviours remains an underexplored area of research. Gender stereotypes permeate men's and women's relationships in the workplace, influencing the ways in which both genders are expected to behave (Sergeeva and Andreeva 2015). It is often the case that women are far more likely to face discrimination than men in the workplace and in society (Paludi and Coates 2011). This issue is not any different when it comes to KM practices.

Organisations that are KM focused perceive male leaders as far more deeply involved in knowledge-sharing than women (Lin 2006). The perception is that males are stereotyped as being competent, assertive, independent and career oriented (Paludi and Coates 2011). As a result, males are still highly valued, particularly those that hold top management positions in organisations (Lin 2006). Conversely, females are stereotyped as being warm, sociable, interdependent and relationship oriented, which is far more suitable when it comes to sharing knowledge (Paludi and Coates 2011).

Research (e.g., Lin 2006; Mukherji and Jain 2009) has shown that women are more altruistic than men, and this characteristic positively influences their willingness to share knowledge within teams and organisations. Females are found to be more helpful in terms of devoting their time to helping others, and providing high-quality support to individuals (Figallo and Rhine 2002). Knowledge-sharing is seen as a form of assistance, where women have a greater tendency to assist others, and are more likely to engage in a culture that shares information (Figallo and Rhine 2002). Furthermore, female knowledge leaders are known to have a positive impact on an organisation (Carmeli et al. 2011). Other studies suggest that males are more likely to be sensitive than females in building professional relationships with others (Lin 2006; Paludi and Coates 2011).

Moreover, men are still perceived to be work oriented, even in those organisations that are KM focused (Sergeeva and Andreeva 2015). The perception is that males take any organisational announcements and messages seriously (Sergeeva and Andreeva 2015). It is believed that they go beyond their minimum job requirements to achieve the organisational goals (Sergeeva and Andreeva 2015). Conversely, women are considered to be more family ori-

ented and likely to ignore organisational messages, or avoid playing an active role when conflicts occur (Edu-Valsania et al. 2015).

However, several strategies can be used to reduce negative stereotyping in the workplace. One possible strategy that can be employed is training both genders to adopt masculine and feminine attributes in leadership, rather than simply expecting females to adopt masculine attributes (Faniko et al. 2016). Another strategy that organisations could consider is empowering women in leadership, by challenging negative stereotypes and encouraging women to seek promotional opportunities as and when they are available (Faniko et al. 2016).

Gender Differences and Knowledge Sharing

Gender differences have long been documented in gender studies but often ignored in the KM literature. Although women have made dramatic strides in gaining access to employment, they still find it a challenge to achieve senior and leadership positions (Belasen 2017). Women's lack of success in reaching top management positions is likely to have a detrimental impact on organisations' growth and development, particularly those that are knowledge focused (Belasen 2017).

Due to historical gender stereotypes and discrimination, women leaders may be less likely to gain the same privileges as their male counterparts (Durbin 2010). For example, informal networking at board level often excludes women, as they are still built on the 'old boy' network club format (Durbin 2010). As a result, women continue to be excluded from informal male networks, which means that organisations may struggle to meet the competitive advantage and their strategic goals (Belasen 2017).

It has been noted that women join networks primarily for social reasons, while men take a more utilitarian approach, using them to facilitate their career advancement (Edu-Valsania et al. 2015). The challenge that most women face is that not all networks are made accessible, particularly those that pertain to seeking leadership positions (Durbin 2010). As noted earlier, the old boy network is typically focused around males, such as socialising in pubs or playing golf while conducting business meetings (Durbin 2010). This may be one of the main reasons why women are far more likely to build weaker networks and thus be impeded in the transfer of complex knowledge (Durbin 2010).

Moreover, men and women are likely to have different influences in creating social relationships. For example, women are more willing to give and

receive social support than men (Chai et al. 2011). In contrast, men tend to be reserved when it comes to sharing knowledge but are more likely to have larger group of social networks (Chai et al. 2011). While men may be comfortable of creating informal relationships (e.g., meeting up with their clients in pubs and restaurants), women are more concerned about the essentials of a relationship, meaning the level of intimacy that they may build when networking with other professionals (Bebenroth and Kanai 2011).

Studies (e.g., Belasen 2017; Bordia et al. 2006) have shown that female leaders are far more encouraging and supportive towards their teams when sharing knowledge. Women are seen to provide greater apprehension when utilising their interpersonal skills to ensure that knowledge is shared and received adequately (Belasen 2017). It is argued that females are far better suited than males to be effective leaders in the knowledge revolution (Rikowski 2007). The extraction of information and ideas received from individuals is a subtle process in KM practices, which involves more demographic and diverse techniques that women tend to execute better (Rikowski 2007).

In line with gender role expectations, women are seen as far more engaged and motivated when building professional relationships with others (Jiang and Hu 2015). Conversely, men tend to be more motivated by social power, influence and the desire to get ahead of others (Jiang and Hu 2015). This means that men prefer to focus only on the tasks that will enhance their career, rather than helping others to develop within the organisation. It has been remarked that having a sound professional relationship with employees and colleagues is important for any organisation, particularly those that are knowledge focused (Jiang and Hu 2015). Therefore, it is important to have a diverse group of men and women in leadership positions. Instead, women are perceived as tokens, especially in an environment that is heavily dominated by men (Bebenroth and Kanai 2011).

Women Knowledge Leaders

Companies that operate globally and nationally are beginning to recognise the value of social interaction and are using several of methods discussed in attempts to encourage their management and employees to interact more frequently (Leistner 2010). For example, Google conduct their regular team meeting in cafes, where refreshments and confectionary are provided as a means to spark the conversation around work and social activities (He 2013). Using this sort of method not only increases morale but engages more with face-to-face interaction in an informal atmosphere. Moreover, employees are

far more likely to ask each other questions and offer assistance in a less pressured atmosphere. As another example, Tesco uses company intranets and social media networks—Facebook and Twitter—to interact with its employees and colleagues (Tesco PLC 2017). Such social interaction is vital for organisations to build trust so that the same vision and language is shared (Campana et al. 2017).

However, the literature suggests that in most organisations employees are less inclined to share knowledge with other co-workers as they do not see clear objectives and/or there is lack of trust towards the senior management team (Janus 2016). Others see that sharing knowledge will reduce one's position, power and status (Janus 2016). Many employees are only known to share knowledge voluntarily if they feel that it is going to have an impact on their work (King 2009). It may be wise for organisations to have a training scheme in place where regular sessions could be applied towards building trust, collaboration and team building (King 2009). This may help to overcome the barriers related to lack of trust and faith, and to fear (King 2009). Furthermore, the presence of top management during these sessions may help to reduce the barriers between the top management and employees (Jennex 2008).

Another challenge that organisations face is having to manage a diverse group of individuals at the top of the hierarchal spectrum. Literature suggests that women are far more likely to engage in sharing knowledge than men (Marouf 2015). Men will only engage in knowledge-sharing when they see a long-term investment in their career advancement (Marouf 2015).

Moreover, diversity is very complex and difficult to resolve, particularly in organisations that are strongly male dominated (Ahmed 2017). For example, male engineers are likely to have a different insight into knowledge-sharing in comparison to a female engineer who works in a male-dominated environment (Gardiner 2016). This already puts up barriers for women that work in such sectors (Ahmed 2017). Another issue faced within organisations is that knowledge is shared among friends, and friendship groups are usually built between individuals that are of same gender, race and ethnic background (Marouf 2015). This instantly excludes minority groups, and as a result they are less inclined to share knowledge freely (Marouf 2015).

Going forward, organisations that are eager for knowledge-sharing may need to take into account how distinct cultures have different attitudes (Schreyogg and Koch 2005; Tryon 2012). Knowledge leaders may want to consider introducing adequate training and suitable networks which support these groups (Grant 2016). It is important to note that if knowledge-sharing within organisations is insufficient or limited, so-called knowledge gaps may occur, which may lead to undesirable business results (Grant 2016).

Organisational Culture

Organisational culture plays a vital part in facilitating employees to be willing to engage in knowledge-sharing and prepared to work together with the top management team. However, in reality, it is far more difficult for everyone to interact with one another efficiently. This is worse when the organisational culture is not supportive and/or the reward system favours only individual efforts and neglects the team (Rechberg and Syed 2014). Having a culture of openness that encourages the sharing of information is crucial for any organisation that wants to achieve a competitive advantage (Leistner 2010).

Organisational structure is extremely important with respect to the flow of knowledge-sharing; it is often responsible for creating silos behaviour, where the free flow of knowledge is impeded, and the culture of knowledge-sharing is hampered (Plessis 2006). It is therefore very important that organisational structure is carefully evaluated to ensure that optimal knowledge creation and sharing takes place effectively (Kiel 2009). A flat organisational structure has been found to be more effective to ensure that knowledge flows both vertically and horizontally (Kiel 2009).

Some organisations (e.g., Apple, Virgin Media and BMW) have begun to actively use a variety of factors to encourage and support knowledge-sharing within teams, such as metrics or fear of losing their job (e.g., previously, employees have indicated that fear of providing incorrect information may lead to them losing their job) (Keyes 2012). Others have changed the organisational structure to ensure that there is easier communication between top management and employees (Keyes 2012). However, firms do not always manage resources effectively. Research (e.g., Carmeli et al. 2011; Plessis 2006) has pointed out the problems that firms encounter in their efforts to facilitate knowledge-sharing between individuals. For example, organisational leaders often misunderstand how to redesign the work structure so that employees are encouraged to interact with one another (Carmeli et al. 2011).

Moreover, a significant body of literature suggests that females are more likely than males to engage in sharing knowledge (Lin 2006). However, males appear to encounter fewer barriers in traditional organisations than females when acquiring career advancement and exposure, a situation that is considered socially acceptable (Lin 2006). It may be wise for organisations to have leadership development programmes and support in place for women. It is often the case that women are ignored when seeking leadership positions and other opportunities within the organisation (Marouf 2015).

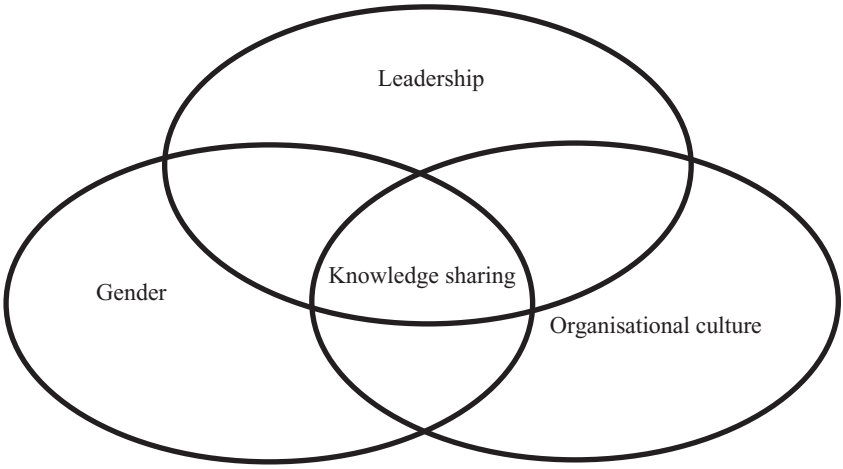

Fig. 13.1 Knowledge-sharing interaction with leadership, gender and organisational culture

Figure 13.1 shows how knowledge-sharing has an impact on leadership, gender and organisational culture. These terms are placed in the figure to show the importance of how they interact when it comes to sharing knowledge.

Discussion

Since knowledge-sharing is about disseminating and utilising information through more than one individual, much of the knowledge-sharing literature has focused on teams or at the organisational level. This chapter has highlighted the need for greater emphasis on how women can make an impact on knowledge-sharing, particularly through leadership. The review shows that while much thought has been given to managing knowledge, the role of women remains underexplored.

This chapter has provided a detailed account of how women and men in leadership roles may differ when it comes to sharing knowledge. For example, women leaders are seen to be far more supportive and encouraging when it comes to sharing knowledge within their teams (Marouf 2015). In contrast, men usually share information only when they consider it to offer a gain for their personal development (Ahmed 2017). It is also known that men prefer to network informally, while women are concerned with the level of intimacy that they may build in a professional relationship (Bebenroth and Kanai 2011).

Indeed, women are still disadvantaged in terms of employment and leadership, particularly in organisations that are male dominated. They have relatively less access to crucial sources of knowledge and less power to manage knowledge. This leaves the few women already in power hesitant to share information with their colleagues, as they believe that it may reduce their power and authority (Janus 2016). Organisations may consider developing a culture that allows women to interact openly and positively with their colleagues and employees in terms of knowledge-sharing and management. In many organisations, the culture is still very much male dominated at the top, which makes it difficult for women to seek or access such positions (Bebenroth and Kanai 2011).

This literature review shows that women are still underrepresented, even though many organisations are moving away from the traditional approaches to leadership and adopting styles suited for KM practices (Bebenroth and Kanai 2011). Even though new styles of leadership are being adopted, most organisational structures are still built around men (Durbin 2010). The review shows that the old boy network still exists at the top, although networking is crucial for both genders (Durbin 2010). Women are still disadvantaged due to structural barriers which make it difficult for them to thrive for leadership positions. This may harm organisations, because research suggests (e.g., Chai et al. 2011; Lin 2006) that it is vital for firms to have a diverse group of individuals at the top in order to prosper in a knowledge economy.

Moreover, women still continue to be negatively stereotyped, even in organisations that are knowledge focused. To combat the negative stereotypes, organisations may wish to consider leadership development programmes that prepare and support women and other diverse groups for leadership positions and knowledge management.

Recommendations

In light of this review, organisations may wish to consider restructuring their culture, particularly those that are very much male dominated at the top. Organisations that have a culture that supports gender diversity are far more likely to be successful when it comes to sharing knowledge within and between teams. Furthermore, it may be useful for organisations to have training or development schemes put in place that can help towards building respect and trust between employees. As some research (e.g., Durbin 2010; Lin 2006) suggests, employees may be less inclined to share information owing to a perception that they may lose their power and authority. There may be also issue

of lack of trust when sharing information with the top management teams (Janus 2016).

Although a few organisations (e.g., Apple, Bank of America, the NHS (National Health Service) have begun to put incentives in place to empower women, it may be wise to have a similar scheme for women seeking for leadership positions. Furthermore, governments could consider offering incentives to those organisations that encourage and promote talented women in senior or top positions. In several countries, such as Sweden and Norway, governments have begun to introduce quotas to encourage and support more women in top positions.

While this review has highlighted that more attention needs to be paid to women when it comes to knowledge-sharing, particularly in leadership positions, it is hoped that practitioners and researchers will pay attention to developing best practices that support women in KM. Scholars may wish to conduct in-depth empirical studies in varied organisational and industrial contexts to assess the potential and actual that role senior leaders play in designing and implementing practices that support women when it comes to knowledge-sharing. Questions such as those around what practices are used to encourage women to participate in sharing knowledge, and how organisations empower female knowledge leaders are likely to be relevant for research as well as practice.

Conclusion

This chapter has argued that there is a lack of attention paid to women in KM literature. The few studies that have focused on women show that they bring vast amount of benefits when it comes to knowing sharing. For example, female leaders are found to be more useful in terms of devoting their time to helping others, and providing high-quality support within their teams (Figallo and Rhine 2002; Tryon 2012). The chapter has argued that increased attention needs to be paid to women leaders when it comes to sharing of knowledge in organisations. Women leaders have great potential in terms of interpersonal skills to ensure that knowledge is shared and received adequately (Belasen 2017). The bottom line is that women have a great ability and potential when it comes to sharing knowledge within teams. In contrast, men tend to be far better at building social networks, which is also crucial in knowledge-sharing. Therefore, it is important that organisations have a gender diverse leadership to enable effective sharing and management of knowledge.

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Part II

Knowledge Management and Boundary Spanning

14

A Conceptual Perspective on Knowledge Management and Boundary Spanning: Knowledge, Boundaries and Commons

Léo Joubert and Claude Paraponaris

Boundaries and transcending boundaries have become a major discussion topic in fields involved in the creation of value in western economies. Quite often assimilated into physical and cultural limits, boundaries are presented as obstacles to entrepreneurial achievement. This entrepreneurial ability is one that unfolds in different fields—the economy, of course, but also cultural activities, notably through a revolution of usages facilitated by internet business platforms. It seems pertinent to compare how commercial and non-commercial activities process information and accumulate knowledge.

Boundaries must be crossed in order to diffuse knowledge and create innovation. But boundaries also act as a protection for scientific, technical and cultural organisations and institutions. Boundaries are multiple and, in principle, objective between projects, organisations, types of knowledge, scientific disciplines and, of course, between the various actors. But are they really all that objective?

The succession of approaches towards knowledge management has a history (Snowden 2002). A genealogy of the concepts and their success is available, testifying to the plasticity of knowledge boundaries. In this sense, our analysis presents boundaries as a construct that enables association between elements as much as separation.

We begin by presenting a genealogy of the major concepts in the field of knowledge dissemination. We lay down the various terms that refer to

L. Joubert • C. Paraponaris (✉)
Aix Marseille Univ, CNRS, LEST, Aix-en-Provence, France

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knowledge boundaries, insisting, in particular, on the persistent misunderstanding about how the learning process leads to knowledge. This conceptual framework helps us distinguish two functions of a boundary—separation and elaboration. We then go on to develop this distinction for commercial organisations, and finally for non-commercial organisations such as Wikipedia.

How Should the Question of Boundaries Be Analysed in the Field of Knowledge Management?

A Conceptual Journey

Evoking the boundary question is closely linked to the development of the role of knowledge transfer. This is a question of strategic thinking focused on the resources required by organisations (Teece 2009). During the 1990s, the resource-based trend (Wernerfelt 1984) later transformed into the knowledge-based view of the firm (Grant 1996), and, finally, dynamic capabilities took over in the strategic analysis of organisations. One of the major authors, David Teece, extensively studied these dimensions, highlighting the role of processes, routines, methods, skills and decision-making rules in developing the competitiveness of commercial organisations. Among these capabilities, resources such as technical and business knowledge were described as strategic. They received very close attention. Such close attention, in fact, that many analyses transformed them into objects distinct from the activities and humans that developed them. This increase in strategic thinking separated itself from sociocognitive approaches (Blumer 1966; Vygotski 1934; Weick 1969), thereby creating an autonomous field of thought. But this empowerment provoked serious misunderstandings that could lead one astray. We summarise the evolution of the concepts and draw on their consequences to define the boundaries in the area of organisational cognition.

Knowing/Knowledge

An analysis of emerging concepts and their influence in economics is regaining in interest. Studies reveal that the practices of an organisation's members are a complex process (Cabantous and Gond 2010). This process develops under the influence of wider socio-historical movements that cross the boundaries of

firms. This process structures management theories engendered by socio-historical movements that eventually become conventions and tools used to analyse and decide on economic matters, and finally the actions of individuals such as consultants who accompany managers in their decision-making. Snowden (2002) illustrates this type of analysis for the formation of knowledge management concepts. He points out the social methods used in structuring such concepts. An entire set of needs has been aggregated around the notion of 'knowledge management' without necessarily appreciating the meaning of this perspective. According to Snowden, knowledge management is an oxymoron. The author strongly criticises the idea that simple will alone is able to identify and transfer knowledge.

Yet the conception of knowledge as an object has become much more important than the processes of learning (knowing). This is a reversal of the possibilities offered by cultural anthropology and ethnomethodology since the mid-twentieth century. The act of 'knowing', in fact, finds one of its origins in this field of research. The role of 'psychological instruments' highlighted by Vygotski (1934) opened the door to cultural studies of learning. This Russian psychologist revealed that in order to conduct one's activities, the child and then the adult uses psychological tools, among which is the language one speaks. Learning consists in appropriating these psychological tools. Mental activity feeds on words, enabling us to develop concepts. Humans evolve within a 'language/thought' system that allows us to develop our cognitive skills. This analysis reveals two important aspects. On the one hand, cognitive activity is completely immersed in language, which is a common good; and on the other, all the cognitive activity of an individual takes place during one's longstanding learning processes. Thus, a dialectic is established between what is appropriated by the individual, and the categories of meaning developed in society. The private and the common evolve in concert.

For the interactionist sociologist Herbert Blumer (1966), meanings develop within social interactions and are tested through an interpretation process by the individual in his relations with the outside world. The context is not an objective fact but it is constantly redefined through interactions. The psychologist Karl Weick (1969, 1986, 1993) presupposes that the process of attributing meaning leads to forming schemas that guide actions thereafter. The context that is constructed plays a decisive role in reasoning; the individual commits actions based on conceptions that he develops (enactment process). Reality is transformed, to a certain extent, by the impact of individual actions. Through a process of selection, the individual can then make this reality intelligible by mobilising the 'causal map' he developed through

experience. In this way, a situation can become ambiguous (equivocality): It can be interpreted in several ways without becoming ambivalent or confusing. This 'new' reality that has become significant for the individual is stored in the form of a causal map (retention process).

An array of approaches to organisational cognition was available as early as the 1970s to study knowledge management processes. Analytical tools were available to evaluate the expansion of knowledge and recognise understanding or 'knowing'. The term 'knowing' is used to refer to the epistemological dimension of the action itself. 'By "knowing", we do not mean something that is used in action or something necessary to action but rather something that is a part of action, both individual and group action' (Cook and Brown 1999: 387).

While the course of cultural anthropology reveals that knowledge does not exist on its own, and that it presupposes a prior learning experience of the subject, situations and supports—such as a language's syntax and semantics—a majority of studies focused on knowledge transfer to the detriment of knowing. This analysis reversal is undoubtedly not foreign to the movement that imposed proprietary ideology in the field of intellectual creations and software (Hettinger 1989). When knowledge is only analysed as result, it becomes an ordinary object. This object can be monetised and dealt in commercial transactions. Then propriety rights take on more and more importance, rather than the cognitive dimensions of learning.

In this configuration, a transfer assumes the existence of qualified actors with separations between them, as well as a project and steps to carry out the transfer. Knowledge has thus been objectified through two means: the invention patent (Almeida 1996) and the scientific publication (Zucker et al. 2002). Academics in search of knowledge diffusion markers have extensively used these two means when studying the transfer of knowledge. Subsequently, the transfer issue turned into a problem of boundaries.

The Challenges of Transfers

Starting in the 1990s, knowledge transfer became a major issue. The definition given to it is minimal and may even be surprising: 'Knowledge transfer in organisations is the process through which one unit, e.g., group, department, or division, is affected by the experience of another' (Argote and Ingram 2000: 151). This knowledge transfer theme was in fact a translation of

resource-based knowledge covering activities related more or less directly to cognitive activities.

Transferring knowledge has become a strategic matter, particularly in regard to the success of mergers between several firms (Doz 1996; Simonin 1999), sharing experience between several subsidiaries of a multinational firm (Hedlund 1994), and in the process of expediting the diffusion of technology between multiple departments (Allen et al. 1979; Amesse and Cohendet 2001). Knowledge can thus be considered an object to be localised and dissociated from its origin of development. For the sake of scientific and technical prudence, knowledge has been reduced to its administrative and codified support: the patent or the scientific publication. As an object, it can be designated by a qualifier. This can be broken down into technical knowledge or relational knowledge. We can then break it down further into certain subtleties, such as explicit knowledge, declarative knowledge and tacit knowledge. We may also rely on an industrial history of experience feedback from major projects in order to designate an available set of transfer methods.

Knowledge transfer is presented as a strategic challenge. Its direct ancestor is probably the technology transfer developed in the 1970s. Without having established a record of several decades of technology transfer between countries, academics have nonetheless developed this notion of knowledge transfer amply. The influence of the studies developed derives more from economic necessity than from the soundness of the fundamental concepts. Since knowledge is so essential to innovation, it is absolutely necessary to make it available and to acquire it. The methods used for acquiring it are less important.

Transfer Difficulties

Knowledge transfer is an instrument through which a commercial organisation can improve its capabilities. To obtain knowledge, it is necessary to identify the relevant knowledge, to acquire it and to assimilate it within the organisation. These operations are easy to enumerate; however, in practice they encounter several difficulties.

Three major types of difficulty are encountered when carrying out knowledge transfers (Becker 2001; Lahiri 2010). The time needed and cost of identifying the relevant knowledge within the organisation can be excessive. If it is

a question of researching the environment, the difficulties may increase. Then, the actual transfer of knowledge from one unit to another can be tricky. This difficulty is highlighted by the fact that the knowledge is contextualised (Szulanski 1996), and inseparable from its source. It refers back to the question of codifying knowledge. This process is aimed at transforming tacit knowledge into explicit knowledge using shared codes and symbols. It is a process of normalisation, establishing communication choices by determining the information details to focus on. Codification involves transforming a system of action into information that can be used to guide future actions. These actions may involve reflection, analysis, classification and categorisation of information or transformation of the material. When this information makes sense, it is referred to as explicit knowledge. This is related to tacit knowledge but is only a complement to the former (Zollo and Winter 2002).

The third difficulty can be seen in the significant cultural differences that sometimes exist between pools of knowledge. Herein lies the question of boundaries. It often happens that a firm's management committee decides to acquire knowledge through licenses, technical publications or even training sessions. But nothing certifies that the agents directly involved in this transfer are able to assimilate the knowledge. The reason for issues is often the cultural distance, in terms of cultural or cognitive boundaries, between the transmitter and receiver of the knowledge transfer. So, it is a question now of either crossing boundaries or exceeding them. This is because the messages sent from the transmitter to the receiver are more or less codified information that is converted into knowledge by the receiver through his intellectual tools, provided that he is interested.

Redefining the Terms of Transfer

These difficulties are covered in specialised knowledge management studies. In this context, the activity of individuals is recognised as a collection of actions that can guide and structure the acquisition and transmission of knowledge. We then deal with antecedents to the action of disseminating knowledge. This reformulation of the transfer terms has the merit of inserting the activity into its context. But the actual cognitive dimensions of the subject's activity remain largely on the sidelines.

The study by Van Wijk et al. (2008) is probably the most comprehensive in this area. The authors define three major dimensions of transfer antecedents: knowledge, organisation and social networks. They connect different variables of these three dimensions to knowledge transfer performance.

Knowledge is addressed under its more or less ambiguous aspect, which can be a positive or sometimes disruptive factor in the transfer. Second, the organisation is defined according to its classic features: age and size, degree of decentralisation of decision-making, and the ability to absorb knowledge. Finally, social networks are the subject of numerous studies. These include social relationships, relationships of trust and value systems. Other studies also cover incentives for employees to spread knowledge (such as remuneration or career advancement).

Using these three transfer dimensions, we can define the boundaries separating individuals, organisations, units within large organisations and social networks. The difficulty of transfer boils down to the difficulty of crossing a boundary. It is a question of compiling an inventory of these difficulties in a market economy approach. In other words, with entities separated from each other, and for which common assets such as language or communication networks do not play a fundamental role.

A Structural Misunderstanding

We thus see a separation occur between two sets of reflection and we are confronted with two definitions of the boundary. On the one hand, dedicated knowledge management research is analysing the limits of disseminating knowledge. This research is carried out as part of capital development strategies in a private form. Here, the boundary creates a separation. On the other hand, social science research fully integrates the dimensions of learning. This research is primarily interested in the details of learning within a constructivist framework. In this case, the boundary is not so much incurred as it is elaborated by means of the intellectual tools available to humans.

The Separation Boundary

In his study of knowledge management theories, Snowden (2002) shows how the socialisation, externalisation, combination and internalisation (SECI) model of Nonaka remains the major framework in management models, while his Cartesian references were set aside a few years later by the Japanese approach in terms of ‘Ba’ by the same author (Nonaka and Konno 1998). The Ba is a philosophical Japanese concept that can be considered a ‘shared space for emerging relationships’. This analysis has importance as it helps us understand the strength of the social-historical movement that

established this boundary concept. Nonaka's studies show all the subtlety of conceptualisation within an organisation, its socialised dimension and its generalisation into products or manufacturing processes. Nonaka's influence is clearly rooted in Eastern philosophy, referred to as constructivist by westerners. Despite this culture of learning and of the place given to subjectivity, the distinction between explicit and tacit knowledge was imposed as a tangible reality in scientific writings and teachings of the western world. On this separation, a boundary theory has been elaborated. This separation stems from a major epistemic confusion, and assumes that what remains unspoken in knowledge is what is not yet explicit. This confusion was thoroughly analysed and criticised by Tsoukas (2009), denying any possibility of separating the tacit and explicit dimensions of knowledge. These are associated with one another as if woven in a braid. Tacit knowledge is not explicit knowledge 'internalised', as Nonaka and Takeuchi (1995: 69) claim, nor is it something that a firm may 'lose' during a period of crisis, as Spender (1996: 73) implies. Rather, tacit knowledge is the necessary component of all knowledge; 'it is not made up of discrete beans that may be ground, lost, or reconstituted […] to split tacit from explicit knowledge is to miss the point—the two are inseparably related' (Tsoukas 2009: 99). If one understands this author, tacit knowledge, which represents the most important aspect of a knowledge transfer, is absolutely not transferable. It cannot be captured or translated explicitly: Tsoukas shows us that the question is in fact badly posed, since tacit knowledge is manifested in what the individual realises. Tsoukas' criticisms address the initial period of Nonaka's work. The latter responded positively (Nonaka and von Krogh 2009), highlighting the interaction between tacit and explicit knowledge along a continuum (636 *& seq.*)

Evidence shows that the different languages used in different parts of the world are an obstacle to cultural and economic exchange. On a slightly smaller scale, several types of boundary are defined and referred to as invisible boundaries (Hernes 2004). Most often, physical boundaries designate spaces separated due to very different respective rules of action. Projects within the same organisation make up such types of segmented spaces. But boundaries are also social and, in this case, these are related to professional attributes. The different professions offer the many roles and representations that employees give to their work. Professional identities that develop within an organisation, and all the more so between different organisations, are boundaries that hinder the dissemination of knowledge. Finally, boundaries are in the mind. Ideas and concepts make powerful boundaries between individuals who are trying to understand, collaborate with or even avoid each other.

The Elaborated Boundary

The second conception of boundaries is inspired by the constructivist epistemology of the social sciences. In economic terms, boundaries are the result of a socio-historical process that installed private property and price competition between disjointed units in the development of R&D, production and distribution capabilities. Furthermore, the market economy is not the only possible economic form. Indeed, the economy of common goods shows another type of organisation of resources and governance (Ostrom 1990). The economy of common goods is seeing a renewed interest in the property sector as well as in the digital economy. A common goods economy is characterised by three complementary elements. It is first either a tangible or intangible resource that is pooled and shared (e.g., open access). It is also a system of property rights attributed to those with guaranteed and protected rights: rights of access, collection, management, transfer and use of the resource. Finally, the common goods economy is distinguished by a governance structure that allows defining rules of action between commoners and towards the resource.

With this form of ownership, collective but limited to a community, the boundary does not have the same characteristics. For example, it may open up the possibility of a non-commercial economy in which information is freely accessible, as in the case of Wikipedia.

This boundary conception is completed with the cognitive dimension by the learning approach inherited from Jean Piaget. Biologist, psychologist and epistemologist, Piaget (1974) distinguished himself with his work on the development of child psychology. Piaget's thinking is valuable in order to break down the knowledge approach in terms of objects. In his theory, each human subject has assimilation structures enabling him to access external data. These structures are the seat of a double process. On the one hand, the subject assimilates sensitive data and information; on the other, he integrates them while accommodating the structures of assimilation. An adaptation thus takes place but not just any adaptation, because by integrating the newness, the subject also develops his adaptability. This complex process is underpinned by a scheme consisting of several faculties that enable the regulation of a subject's activity. This entire dynamic is called equilibration of cognitive structures.

The scheme's concept is highly developed in the areas of the psychology of learning and teaching (Vergnaud 1990). The scheme is structured on four main elements:

– operative invariants of two types: what the subject holds to be true (theorems-in-practice) and what he holds to be relevant (concepts-in-practice);
– inferences: collecting information, calculations and controls that allow adjusting the scheme to the variables of the situation;
– rules of action: components that generate sequences of actions leading to the sought result;
– expectations of the results related to the purpose of mobilising the scheme.

In a routine or learning situation, the individual is not in an area cut off from his environment. Here, the concept of cognitive boundaries that separate have a very weak significance. The individual reasons instead according to references to his past experience (operative invariants), then by analogy (inferences and rules of action). The notion of the 'double regulation of activity according to situation and subject' is better adjusted to this circumstance (Rogalski 2004).

We are clearly situated within the practice of knowing. We are interested in the cognitive process as such, and no longer just the organisational context. As a result, the transfer loses its consistency and the boundary appears as a construction by the actors, since perception directs the intention that in turn guides the action. From a methodological point of view, we need to realise that too much separation continues to exist between the various approaches interested in the same study subject. The issue of mobilising knowledge from a management point of view, the analysis of cognitive processes of the construction of meaning and, finally, knowledge engineering approaches are still too far from each other. To try and associate these two conceptions of boundaries is part of the process of reconciling the various knowledge management approaches.

Two Boundary Traditions in the Analysis of Commercial Organisations

Boundaries separate but they also connect. This is true for territorial boundaries; it is also so for cultural boundaries. Translating from one language to another and transforming one code into another code form boundary crossings that do not alter the separation that remains. Conceivably, boundaries are a sustainable separation. At the same time, spanning them requires resources and arrangements that, in a certain way, establish continuity between spaces that are, in principle, separated.

Boundaries as Separation and Methodological Individualism

Boundary Practices

In the field of knowledge management, critical situations are those for which either a significant change has been committed to, or the complexity of resources will likely generate entropy.

Changes concern periods of strategic transition. A change in a firm's business can cause a loss of organisational routines. It can lead to a renewal of the firm's knowledge base. An acquisition or a merger can also represent significant changes. These operations disturb the existing organisation and hierarchies. They can lead to redefining of the information systems, the terms of data retention and the patterns of communication between the various business units of the firm.

Of additional interest is the complexity of resources. This complexity has become the object of studies in terms of social networks, sometimes referred to as strategic networks. This involves, for example, analysing franchise networks, business networks or R&D alliances using network analysis methodologies (Inkpen and Tsang 2005).

In situations of change, such work looks at the ability to reassess situations and learning during mergers and takeovers. For example, Bresman et al. (1999) analyse the transfer of knowledge during situations of international acquisition. The firm is analysed as an assembly of distinct professional communities. The question asked is that of what are the best structures that facilitate the transfer between them. Resources that facilitate the transfer, according to the authors, are the following: face-to-face communication, visits and meetings between partners of different entities, and the codification of knowledge in the form of objects (patents and grey literature). In this work, time is an important resource as it enables better assimilation of the novel.

In the case of internal growth, studies highlight the advantages of sociotechnical systems (Bender and Fish 2000). The multinational company Bosch is used as a good example of a transfer based on a powerful sociotechnical system. An intranet system (the third largest in the world) connects 160,000 employees through dozens of subsidiaries, and very strong incentives are provided for the mobility of the technicians in order to facilitate the transfer of skills, knowledge and expertise. This kind of information system experience has often been reported. A successful knowledge transfer cannot be assimilated through a simple transmission of information. It is all about bringing together an efficient information system and a system of varied and frequently affirmed relationships between employees (Davenport and Prusak 1998).

In a more general way, boundary spanning is examined using the structural dimensions of the organisation, along with the cognitive and relational dimensions. To facilitate the crossover, the organisation's structures should focus on employee autonomy, authority must be decentralised, and the number of employees must be sufficiently stable (Orlikowski 2002). The cognitive and relational dimensions are often merged. Lessons from the case studies emphasise the sharing of a vision and collective goals. National or regional cultures must accommodate each other. On a strictly relational level, the risk of misunderstanding must be contained by developing a clear system of incentives.

With the study of networks and social capital, the interest is in individuals and their ability to relate to each other (Gulati et al. 2000; Inkpen 1996; Inkpen and Tsang 2005; Nahapiet and Ghoshal 1998). Through one's various relationships, each person develops a certain amount of social capital. Social capital is thus defined as '[t]he ability of actors to secure benefits by virtue of membership in social networks or other social structures' (Portes 1998). Two sizeable questions structure this work at the individual and collective level: How does the dimension of social capital influence an organisation's ability to acquire new knowledge? What are the conditions that facilitate the transfer? The findings of these studies do not fundamentally differ from those on strategic change—the context of communication is crucial. The issue of transfer is placed within the dynamics of the organisation. The social and organisational dimensions are considered to be determining factors. In this context, it is recalled that the transfer of tacit knowledge is more difficult to achieve than that of explicit knowledge (Zander 2002). One is often lead to the conclusion that '[h]igh care relationships favour both the transfer and creation of knowledge' (Zárraga and Bonache 2005).

Limits of Individualism

This conception of boundaries has the advantage of defining the difficulties of disseminating knowledge and determining solutions. Its foundations are legal and economic before being cognitive. We can consider that the crossing of boundaries through the transfer of knowledge is never analysed as a true transfer. The reason for this is straightforward: Although an object can be transferred from one business unit to another, knowledge cannot. The cognitive process of boundary spanning is not supported in this approach, simply because entities (individuals, projects, organisations and networks) are assumed to be separate and separable. This is the big

problem behind the shortcomings of the organisational analysis of cognition (Schneider and Angelmar 1993). According to these authors, economic analysis has not integrated all the elements allowing a true study of the dynamics of knowledge. Three levels of analysis have been formulated:

– Cognitive structures (schemes, beliefs, and scenarios): knowledge models, or epistemological structures.
– The cognitive process: the particular manner in which knowledge is selected, organised, transformed, stored and used.
– Cognitive styles that highlight individual, collective and organisational differences in the way that information is processed.

Are these levels effective in order to explain the main reasons for boundary building?

In fact, this inventory is not sufficient because we could reconstruct many other separations between various structures, different processes and contrasting styles. Therefore, we must look even further, or rather below the level of the units.

In separations between units, language is not taken into account. Whether natural languages or specialised languages with specific codes, these are still common elements that occupy the economic and social space. If the economic units obtain an individual status by law (private property) and by market mechanisms (price), they cannot be isolated in cognitive terms. This observation and resulting analysis fall within the process of individuation (Simondon 1989). The two philosophical conceptions of individuation are opposed: the substantialist and monist conception considers a being as based on itself; the bipolar or hylomorphic conception considers the individual as engendered by the meeting of form and matter. In other words, 'we must make a reversal researching the principle of individuation, by considering as primordial the operation of individuation from which the individual comes into existence and from which he reflects the unfolding, the regime, and finally the modalities in his character' (Simondon 1989: 12). Thus, the individual and his environment must be considered in order to analyse a process of individuation. This process is both psychological and social. The individual needs the group to constitute himself; he becomes an autonomous entity through the group to which he is connected. This is referred to as transindividuation.

The separate conception of entities in this way loses its analytical power. We must then consider its complement.

The Elaborated Boundary

Mechanisms, Learning and Continuity

Among the many empirical demonstrations of a boundary that is not a separation but a continuity, two processes are very instructive: tutoring and boundary objects. Tutoring has functional qualities that are not very well known, whereas boundary objects have the benefit of extensive literature.

Tutoring or mentoring is a common practice in organisations. It may fall within formal procedures or develop autonomously within professional communities. It is a learning process intended to advance the knowledge of a new employee or to transmit the knowledge of an employee leaving the organisation. This learning situation creates an interaction in which each of the actors (expert and novice) can learn.

Brassac (1994, 2008) developed a methodology to help in the transmission of experience using a social psychology approach. In his method, knowledge acquisition is a process in which at least two actors are jointly responsible: the tutor and the learner. This process unfolds within a set of social interactions made up of discursive exchanges, gestural manoeuvres and by manipulating machines. For the actors, it is a matter of maintaining these interactions; there is not, in itself, a transfer of knowledge. The process is a joint construction of meanings that are meant to be used and appropriated by the learner. To facilitate this appropriation, Brassac developed a methodology that integrates the largest possible amount of data from the context of interaction. According to the author, the recordings of an interview and their analysis are not enough. The tutor's lessons and the learner's apprehension thereof must not be disconnected. Nor should the expression of expertise be abstracted from its concrete place of realisation. Finally, one should not prevent the two actors from representing their work with graphs.

Thus, the various actors are provided with the opportunity to develop a range of direct relationships: relationships to knowledge, hesitations, oversights, dependence on documents, and limitations. The ability to question, to point out inconsistencies and to offer new opportunities is maintained. The prospect of sharing is therefore related to the fact that knowledge is distributed between the tutor and the artefacts (documents, equipment and physical spaces). According to the Brassac, a good strategy involves focusing on going back and forth between the different modalities of knowledge collection. These iterations promote diversity and redundancy, which are factors towards consolidating learning.

This method of tutoring does not separate the tutor from the learner, or the expert from the novice. However, it allows the identification of discrepancies between the performative statements and experiences. On this basis, the actors are qualified to produce recommendations and reformulations for the performance.

The second practice is very present in design offices and in cooperative design. In these areas, knowledge is just as localised in the problems that arise as in the practices of individuals. In their design work, individuals work with objects such as numbers, technical notes, tools and machines, as well as with results such as sales contracts, prototypes and purchase orders. These objects create a punctuation in the time aspect of the design process and thus a boundary.

The object is the concrete form of the boundary between two worlds. 'Boundary objects are those that are both plastic enough to adapt to the local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites' (Star and Griesemer 1989: 393). These objects are apparently weakly structured and take on meaning during interactions. While expressing a boundary, they are somewhat receptive to different arrangements proposed by the participants. At all times, the design is simultaneously fixed and also ready to evolve.

Carlile (2002) focuses on the difficulties of collaboration between engineers and other specialists as they work within their respective fields. Rather than focusing on knowledge flows, he studies the objects that participate in attempts at mutual comprehension. The objects are vectors of representations because they are oriented by an intention or a goal stemming from a sociotechnical-economic world. For example, a drawing represents the dependencies between different designers as well as its consequences in terms of the work's progression.

Carlile defines three main characteristics that can facilitate knowledge transfer (Carlile 2002: 451–452):

– 'A boundary object establishes a shared syntax or language for individuals to represent their knowledge' (syntax);
– 'An effective boundary object […] provides a concrete means for individuals to specify and learn about their differences and dependencies across a given boundary' (semantic);
– 'An effective boundary object facilitates a process where individuals can jointly transform their knowledge' (pragmatic).

Holford (2016) develops, in this sense, a constructivist theory of boundary objects: Objects do not pre-exist but emerge by means of intellectual con-

structions, enactments, agency mechanisms (Barad 2007) and situated actions (Suchman 2006). The author suggests abandoning the idea of a duality between the subject and object in favour of an intra-interaction process. This process is attached to the mental work of the subject. It participates in boundary construction and constitutes a credible alternative to the dichotomous 'subject–object' or 'results–process' approaches.

The Work of Creating the Boundary: What Is a Mechanism?

This boundary creation is not completely opposed to the idea of boundaries as a separation. Instead, it introduces a final concept that one must consider: the mechanism. This concept was developed in the mid-1970s through the work of the French philosopher Michel Foucault (1976). He defines the mechanism as the network that can be traced between the various heterogeneous elements that progressively form a whole, consisting of discourses, institutions, laws, physical areas, administrative rules, scientific statements or even philosophical and moral propositions.

For organisations, and in the cognitive domain, mechanisms are defined as organised, finalised groupings of intellectual objects structured among themselves and distributed for the production of goods or knowledge (Poitou 1995, 1997). Intellectual objects are able to elicit practical and technical intellectual steps inherent in artificial objects, such as automated equipment and machines. These approaches use the resources of analytical tool. Thus, the individual works within a very diverse set of resources using his mental tools.

For commercial organisations, these mechanisms are set up to meet intensive innovation needs. A typology is provided in this area by Charue-Duboc (2006, 2007). These mechanisms are developed to promote learning between projects, learning with external entities or even learning by exploration. For example, mechanisms with external entities are considered 'boundary spanners' (Allen et al. 1979), and 'absorptive capacity' (Cohen and Levinthal 1990) is necessary to absorb external knowledge. Recent developments identify two models: The first involves reproducing within the firm the scientific divisions of the academic world in order to facilitate relations with the outside. The second model focuses on specific industrial problems and tends to unify different academic fields. Within a department, different skills are combined to build expertise on themes common to several projects.

But these mechanisms are never stable. They are constantly recomposing themselves in time and space. The individual at work does not need to use all available knowledge. This makes variety and discontinuity possible within

human activities, as well as the prospect of cooperation. Knowledge is located in the working environment, and distributed among all the technical elements composing it, and with the operators. This distribution is not immutable; it is constantly renewed according to the needs of the various phases of operation and cooperative interactions between agents (Poitou 1995, 1997).

Although the mechanism is a concept that describes fairly well the elaboration of boundaries, it should be limited. What could be the density of a mechanism? In this field of study, opposition developed between two analyses (Shinn 1997). One emphasises the rigidity of boundaries between scientific disciplines: Epistemologies as well as the historical elaboration of scientific institutions have set up particular mechanisms of coordination in the scientific and technical world. The other approach highlights a 'seamless web', that is, a powerful restoration of harmony between disciplines. It is anchored in the actor–network theory and assumes a high density and a strong extension of the mechanism. Shinn, on the other hand, shows that there can exist a convergence between different scientific communities but that it takes place using the resources offered by the division of labour between disciplines. So, boundaries play their part. This does not prevent high levels of knowledge hybridisation between scientific disciplines, between science and technology, between the firm and external entities.

Boundaries of Information and Knowledge-Sharing

Here we examine the boundaries of knowledge in the context of non-commercial organisations. We illustrate the boundaries of information-sharing in the case of Wikipedia. This website went up online in 2001 organised on the wiki principle that everyone can openly modify everything, anytime and anyhow. From a few hundred initial contributors, Wikipedia quickly grew and became the biggest wiki ever built. In its English version, as of the time of this writing it holds over 5 million articles and has more than 30 million contributors, of which approximately 134,000 are active every month. Claiming the production of encyclopaedic content, Wikipedia introduced a break with classical encyclopaedias, where an author had to be academically recognised to be entrusted with the drafting of an article. In the case of Wikipedia, even a first-year sociology student can edit the page corresponding to sociology. This has not failed to create several controversies about the reliability of the knowledge found there. Among all these works, Zhang et al. (2010) raise the question of whether the experts of a specific area are a source that is significantly

used by wikipedians writing the corresponding pages. The methodology is based on a comparative survey of Wikipedia articles on terrorism, and a database of individuals, events and terrorist networks put together by professional analysts. Giles (2005) proposes a comparison between Wikipedia and Encyclopaedia Britannica on similar articles. Parallel to these discussions, Reagle (2010) offers a very detailed view of collaborative culture as the foundation of interactions between contributors. This latter work enables immersing ourselves in the daily interactions that produce and reproduce the wiki. We will put aside this discussion now in order to focus on how contributors build boundaries in the corpus of documents that they produce.

We briefly explore the project's central concept, which replaces the notion of category in an encyclopaedia such as the Britannica. These projects at once provide separations but also powerful tools for drawing up boundaries. Wikipedia's projects—or 'WikiProject'—are local spaces dedicated to social construction of governance. For instance, the page 'Wikipedia:WikiProject Economics' lets us see a different regulation of contribution than the page 'Wikipedia:WikiProject Philosophy'. Of course, this means that economics articles are not regulated the same way as those of philosophy. In that way, projects are more than the classical 'category', but at the same time, they are a regulation tool that allows different contributors interpret—and respect—the same rules differently.

The Boundaries of a Wiki

The word encyclopaedia is forged by the contraction of the Greek enkyklios, which refers to the circle and its construction, and paedia, which designates education or transmission. Throughout history, the encyclopaedists set themselves the goal of bringing together in a book, a library, or a database all knowledge worthy of being used in the pedagogy of new generations. The contents of these works gives us a clear view of knowledge as the foundation of civilisations. It was thus during the Song Dynasty, which gathered together in the largest encyclopaedic work of China all the knowledge necessary for the instruction of the high officials of its administration. In the same way, there were Arabic-Muslim encyclopaedias, which included rules of propriety with exegeses. Rey (2007) offers a vast history of encyclopaedism, situating it in a millennial process. This same process led us in the West during the Renaissance to a secularisation of encyclopaedias. Formerly created as educational tools for the use of the clergy, they became systematic inventories organised according to classifications in which God seems to have stepped aside. The most famous of these classifications, proposed by Francis Bacon in his Novum Organum, is still

used today in reference encyclopaedias such as the Britannica. We need to go beyond the scope of this discussion to show the response of this new classification scheme to the upheavals of the time: the renewal of trade, the discovery of America, and the advancement (already!) of communication technology.

Except for a few details, Wikipedia is not innovative in terms of its categories. In the English version, articles are divided into the following groups: arts, biography, geography, history, mathematics, sciences, society and technology. Here we find classification categories to which academic eyes are rather accustomed. It seems to us that the real difference between the Wikipedia project and the categories of classical encyclopaedias lies not in their titles but in their construction methods. An article in the Britannica is likely commissioned by an editorial board to an academic, then inserted into an already determined category. Conversely, Wikipedia's articles on the arts are created by the personal initiative of a motivated contributor, which does not rely on a pre-established order of categories. They are then attached to the relevant art project, whose summary is built after the fact.

In terms of boundaries, we find in the gradual differentiation of projects an elaboration process of Wikipedia's internal boundaries. At the beginning, we had articles that tell us about the Mona Lisa and the Higgs boson. It was only later that these articles were attached to collections that refer to the arts and physics. It is also interesting to note that the projects fit together like Russian dolls. For example, in the science project we find a physics project, itself divided into space, time and cosmology projects. Articles can be linked to several projects, and here we find the theories of Leuf and Cunningham (2001), according to which the computerisation of knowledge management moves us away from categorisation and towards tagging. The category puts itself in a box, the tag highlights a character, and indexes the corresponding entities.

This organisation led to an information governance which is one major criterion (Coriat 2015) that allows to qualify Wikipedia as a commons. Forte et al. (2009) analyse in detail the decentralised nature of Wikipedian governance. The wikiproject economics is not governed in the same way as the wikiproject philosophy or the its physics. Without entering into these subtleties here, we invite the reader to browse these web pages and observe the different management tools in place.

Separations that Develop Boundaries

Consider now a very simple story replayed at least a hundred times every day on Wikipedia: two articles, for example one on *sociology* and another on *economy* are put together, each with their contributors. Perhaps also the contribu-

tors are working on both one *and* the other. At a point in their development, one of these two articles will create a hyperlink to the other. This banal operation commonly used by many contributors might be interpreted as establishing a boundary between the two articles. Therefore, at least three lessons can be learned about the construction of boundaries within shared information.

First lesson: shared information is inseparable from its delivery method (Coriat 2015). Through its interface, Wikipedia offers ways within the reach of any contributor to create links between pages. First, with a mark-up system, then today with a visual editor, simplifying the task yet a little more. To create a link between Howard Becker and a sociology article, it is only necessary that the word Howard Becker be mentioned at least once in the sociology article. And, of course, it is possible for anyone to add the link. We can even go a little further by mentioning the red links to which Wikipedia users are accustomed. When a hyperlink appears in red, it points to a page that has not yet been created. This MediaWiki feature has proven rather effective in stimulating the creation of new articles.

Second lesson: for a link to exist and persist, the two articles that it links must continue to exist and persist. We can only develop a boundary between distinct elements. Although this observation may seem trivial, it implies that the elaboration of a boundary is a powerful consolidation vector for wiki. Strictly speaking, when consulting a wiki page we see what has been written by a contributor. But, above all, we only see what was not erased by the contributors who modified the page afterwards.

Third lesson: the article's development implies the creation of links. McGuinness *et al.* (2006) show that the articles assessed by the contributors of featured articles are also the most cited, that is, the ones with the most contributors develop the most boundaries. The featured articles are selected through a voting procedure in which the article can be rated by any other contributor. If it receives more than 75 % favourable votes, it is then promoted with a label made visible using a small star below its title.

These three lessons lead us to believe that, more than the transfer of knowledge, it is the boundaries that must be multiplied in order for the sharing of information to be able to function. To pursue knowledge transfer from one contributor team to another would be irrelevant in the wiki context. To take just one example, a mention from the sociology article probably does not belong in the economy article. At most, a presentation of standardised information can be exchanged, for example, in the presentation of bibliographic references or illustrative documents. An encyclopaedia needs to differentiate areas in order to exist as such. However, linking them together is a very effective way of making a cognitive map appear around the object of the article. It is this tension that makes the hyperlink. And it is for this reason that it has taken such an important place within Wikipedia.

Silva et al. (2011) show that the distribution of the links between the different projects can vary. While biology and medicine projects saw their articles strongly linked to each other, the opposite was true for articles related to physics and mathematics. This result echoes the decentralisation of governance that we mentioned: In addition to presenting themselves differently to the contributors who draft them, projects lead to a structural differentiation of the pages, beyond their content.

On the other hand, one does not have to be a data scientist to understand that articles will bind together all the more readily if they are included in the same project. If we write an entire article on sociology, it is likely that the name of Howard Becker will be mentioned. The converse is true: It is even more difficult to see how an article on Howard Becker could not make mention of sociology. In addition, the Howard Becker article will probably be attached to the social science project. We therefore find two articles linked within the same project.

Through these two examples, we wanted to show that the conceptual framework outlined in the first part is operating beyond the distinction between the commercial and non-commercial realms. Opening our sight to the non-commercial unities has not yet be very much done. But with this very short and quite exploratory analysis, we attempt to show that it can be heuristic.

Conclusion

At the end of this analysis, we should first like to emphasise the interest in historical and reflexive analysis brought to the concepts of knowledge management. Such an analysis can illuminate the construction of real cycles of scientific interest mixed with economic interests.

We then highlight the genealogy of the two different conceptions of boundaries. Taken one after the other, these two concepts may seem very different but they are in fact complementary. Boundary separation may suggest that the alternatives are very limited, and that only economic objectives allow the forcing of a passage. On the contrary, the boundary as an elaboration replaces the terms of the analysis by recalling the role of learning processes. The boundary is then considered in terms of knowledge hybridisation.

This hybridisation emerges clearly in the semantic processing implemented within information sharing such as on Wikipedia. This allows us to finally emphasise two major ways of relating to knowledge. For commercial organisations, knowledge is a strategic resource and a commodity. An analysis of boundary spanning is very closely linked to the issue of private property. On

the other hand, in the case of sharing, knowledge is a cognitive and social resource, dissemination of which can be guaranteed by a negotiated collective ownership.

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15

Organising Innovative Knowledge Transfer through Corporate Board Interlocks

Hendrik Leendert Aalbers and Bastiaan Klaasse

Introduction

With innovation regarded as one of the most critical determinants of organisational performance and a critical source of competitive advantage, an important aspect of a firm's strategy should be the facilitation of innovative knowledge exchange (Crossan and Apaydin 2010; Miller and Triana 2009). In order for an organisation to innovate, access to the right resources is indeed critical. It is thus no real surprise to see that both firm resources and innovation have been prominent themes in knowledge management studies in the past two decades (Lee and Chen 2012). In an ever faster changing and internationalising market, the knowledge a firm requires for innovation is spread across more countries, organisations and people (Quintane et al. 2011). Innovation advantages no longer lie in the organisation's internal resources, but rather in its ability to recognise, assimilate and apply valuable external knowledge (Cegarra-Ciprés et al. 2014). For knowledge-intensive firms (Millar et al. 2016) such as those in the 'high-tech' industry, which are characterised by high levels of research and development (R&D) (Ahuja 2000;

H. L. Aalbers (✉)
Department for Business Administration, Radboud University, Nijmegen, The Netherlands

B. Klaasse
Centre for Organization Restructuring, Nijmegen School of Management, Radboud University, Nijmegen, The Netherlands

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Stuart 2000) in support of their innovative capabilities, it becomes increasingly important to strategically manage knowledge resources.

Access to knowledge can be managed and arranged at different organisational levels.

This chapter focuses not on the frequently studied innovation process itself (e.g., Kijkuit and Van den Ende 2007; Whelan et al. 2011), or on the success of innovation efforts (e.g., McCarthy and Aalbers 2016), but on leadership's propensity to innovate, or in other words, the upper echelon's commitment to innovation. It sets out to clarify how board interlocks affect the board's strategic decision-making process in terms of allocating resources to innovation. Previous academic work has shown that board characteristics are related to an organisation's strategic direction. Indeed, many studies have shown that relations exist between organisational outcomes and board characteristics (Johnson et al. 2013). For instance, board size and diversity in terms of occupational background are found to be negatively related (Goodstein et al. 1994) as well as positively related (Haynes and Hillman 2010) to strategic change. Moreover, board size and ties to financial institutions are positively related to survival in times of industrial decline (Filatotchev and Toms 2003), and board diversity is often associated with innovation (Crossan and Apaydin 2010; Midavaine et al. 2016). Focusing on corporate ties specifically, Yoo and Reed (2015) find that top managers with intra-industry ties (connections with entities inside the focal industry) are more likely to adopt a resource imitation strategy. Geletkanycz and Hambrick (1997) show that that extra-industry ties (connections with entities outside the focal industry) are in turn negatively related to strategic conformity. Chen et al. (2013) argue that the effect of corporate board ties on innovation is an understudied research area which should be investigated in more detail. Thus, a relation exists between board characteristics such as the configuration of corporate ties and the strategic direction of the firm.

In this chapter, we propose that board interlocks can be seen as an organisational aspect that can be used to organise for innovation by linking an organisation's board to diverse and external knowledge sources that provide it with opportunities for innovation. More specifically, this firm-level study focuses on inter- and intra-industry ties of corporate board members of companies residing in the Netherlands and Germany in relation to the board's commitment to innovation. The goal of this chapter is twofold. First, we draw on the knowledge management and social network literature in order to determine the mechanisms through which corporate board interlocks are related to innovation. This is done by systematically reviewing literature emanating from these research areas and formulating three hypotheses. Second,

we empirically examine the relation between corporate board interlocks and a board's commitment to innovation by performing a lagged hierarchical multiple regression analysis using public company data.

Theoretical Framework

Knowledge Management & Corporate Board Interlocks

Firm resources and innovation have been important themes in knowledge management literature (Lee and Chen 2012). Knowledge management is defined by Inkinen (2016) as 'the conscious organizational and managerial practices intended to achieve organizational goals through efficient and effective management of the firm's knowledge resources' (p. 232). It refers to how organisations obtain knowledge, for instance through organisational learning, which is critical for maintaining a firm's competitive advantage (Venkitachalam and Busch 2012). As such, the innovative inclination of firms depends on both their established knowledge and how they use and develop it, emphasising the role of both formal and informal, trust-building managerial action. The relevance of corporate board interlocks as informal organisational relations can be observed even in the most dynamic of industries, such as the fast-paced bio-tech sector where companies use inter-personal upper-echelon relations—and the underlying assumption of board-level trust—as an informal coordination mechanism to forge future R&D alliances (Aalbers 2011). Inkinen's comprehensive literature review shows that knowledge-based human resource practices (i.e., strengthening affective commitment and trust building), technology-oriented practices for knowledge management (i.e., the effective use of information technology) and strategic management of knowledge (i.e., monitoring and measuring a firm's knowledge resources) are proven influential drivers of innovation and firm performance.

From this perspective, then, what are the antecedents of innovation, and how can firms strategically manage their knowledge resources? Phelps et al. (2012) argue that social network relationships are influential in explaining the processes of knowledge creation, diffusion, absorption and application. Network ties (Ahuja 2000) and central network positions (Tsai 2001; Van Wijk et al. 2008) are found to be positive stimulants of innovation (Aalbers et al. 2013, 2014). These studies suggest, however, that this effect also depends on the level and relevance of absorptive capacity, which relates to the ability to

recognise valuable external information, and to assimilate and apply it (Cohen and Levinthal 1990). Recent network research has attributed distinct benefits to different hierarchical layers within the firm, identifying desirable influence resources such as access to funding, prestige, power and privileged access to those in senior positions (Aalbers et al. 2016; Johnson et al. 2013; Westphal and Milton 2000).

The question arises as to which network relations matter and which knowledge sources firms should be connected to in order to benefit. Hambrick and Mason's (1984) upper-echelon perspective states that organisational outcomes are partially predicted by managerial characteristics. Organisational outcomes are to a large extent a function of the top management team and board (Dezso and Ross 2012). Board characteristics include, for instance, board size, average age and gender diversity but can also include managerial network ties, for instance connections to other organisations through corporate board interlocks which occur when companies share one or multiple board members. An interlocked board member can be seen as a link in a network of interlocked boards where the end of the link, the other organisation, may provide the focal company with resources, for instance in the form of financial aid or knowledge (Lamb and Roundy 2016). Therefore, this chapter proposes that corporate board interlocks can be seen as an organisational aspect which can be used for the strategic management of knowledge and innovation by linking an organisation's board to diverse and external knowledge sources that provide it with opportunities for innovation.

Corporate Board Interlocks

Specific to coordinated market economies in general, and countries such as Germany and the Netherlands in particular, is the two-tier board system. Within this system, depicted in Fig. 15.1, the top decision-making body of organisations is divided into two boards that meet separately from each other. The executive board is responsible for the day-to-day operation of the organisation, while the supervisory board is tasked with monitoring the actions and functioning of the executives, approving strategy and protecting the interests of the shareholders (Heemskerk 2007). In terms of a one-tier system, where only one governing board exists, it can best be compared to inside and outside directorships. Inside directors are employed on a daily basis by the company where they reside on the board, while outside directors are not (Pfeffer 1972; Westphal and Bednar 2005).

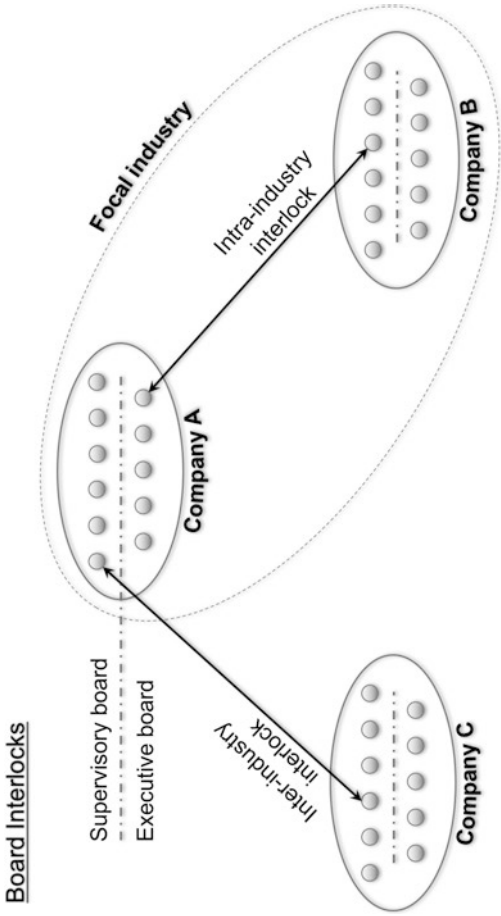

Fig. 15.1 Inter- and intra-industry corporate board interlocks

If a member of an executive or supervisory board of one organisation also occupies a position on the board of another firm, the two organisations become connected through this board member. For instance, in Fig. 15.1, company A is connected to company B as well as company C through mutually shared board members on both the supervisory and executive boards of these organisations. This connection between two corporate boards is known as a corporate board interlock or an interlocking directorate (Heemskerk 2007). As Fig. 15.2 portrays conceptually, these corporate board networks quickly become complex structures that stand to benefit from network analytics as a method to study their actual composition and evolution over time.

From the perspective of the firm, board interlocks may serve different purposes such as monitoring capabilities, signalling to (potential) investors, gaining access to the human capital of board members and, most relevant to this chapter, providing the firm with crucial resources such as access to diverse and unique information (Lamb and Roundy 2016). Howard et al. (2016), for instance, find that interlocked firms are more likely to engage in R&D alliances, thus gaining access to each other's knowledge resources. Scholars often distinguish between two types of interlocks: inter- and intra-industry (Crossan and Apaydin 2010; Haynes and Hillman 2010), also known as vertical and horizontal interlocks respectively (Ruigrok et al. 2006). This classification refers to whether an interlock is with a company within the same industry (intra-) or whether it is with a company outside of the focal industry (inter-), as shown in Fig. 15.1.

Inter-Industry Interlocks

Absorptive capacity is 'the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends', which is 'a critical component of innovative capabilities' and is 'largely a function of the firm's level of prior related knowledge' (Cohen and Levinthal 1990, p. 128). The concept of organisational absorptive capacity is based on the individual cognitive structures that underlie learning. Cohen and Levinthal (1990) present evidence that prior knowledge increases the ability to memorise new knowledge (acquisition) and the ability to recall and use it. Furthermore, where the new knowledge is a set of learning skills, a previously acquired set of learning skills can enhance the performance on a new learning task (Howard et al. 2016). Problem-solving and learning capabilities, however, are so similar that no differentiation is made; the only difference lies in what is learned: learning capabilities involve the development of the capacity

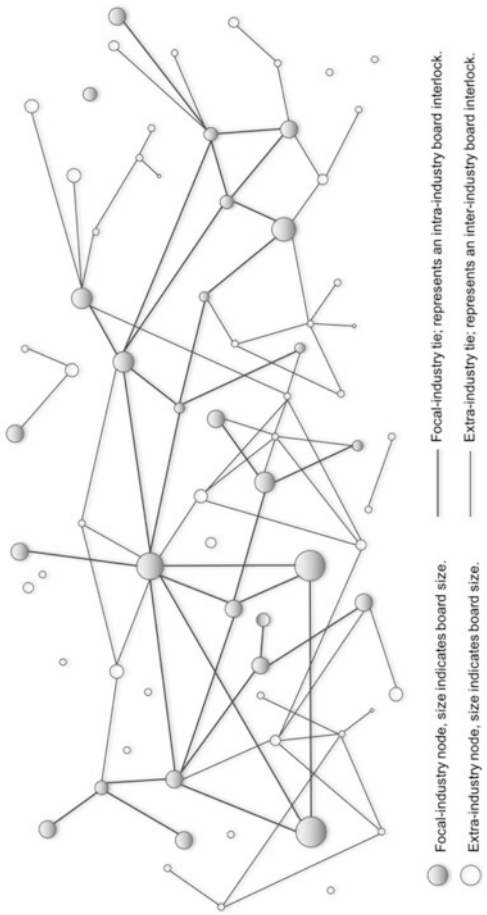

Fig. 15.2 Exemplary focal-industry network with extra-industry ties

to assimilate existing knowledge, while problem-solving skills represent a capacity to create new knowledge. The most important notion is that the ability to assimilate information is a function of pre-existing knowledge: learning performance is greatest when the subject is related to something that is already familiar. Here the concept of knowledge diversity emerges. If uncertainty exists in the knowledge domains from which potentially useful information may emerge, a diverse background increases the chance that information will relate to what is already known. As such, knowledge diversity not only increases assimilative powers, it also acts as a stimulant to innovation processes by enabling one to make novel associations and linkages (Cohen and Levinthal 1990).

Ye et al. (2016) address knowledge diversity and provide evidence for its positive effect on innovation. Their study focuses specifically on the complementary joint relationship between internal (residing within the firm) and external (residing outside the firm) knowledge diversity (called heterogeneity in their study) in influencing innovation performance. Findings indicate, in line with absorptive capacity theory, that firms depending too much on external knowledge and too little on internal knowledge lack the ability to assimilate because a diversity of internal knowledge increases the chance that the firm can relate to novel information. Building on the same arguments derived from absorptive capacity theory, similar results were found by Lin (2011) who shows that firms with high levels of knowledge diversity benefit more from strategic alliances and mergers and acquisitions in terms of firm performance. Other scholars refer to external knowledge diversity as the 'breadth of external knowledge sources' (Leiponen 2012; Garriga et al. 2013) and also find positive associations with innovation performance. Focusing specifically on internal knowledge diversity, Carnabuci and Operti (2013) show that the internal diversity of knowledge among a firm's inventors decreases innovation due to recombinant reuse and increases innovation by creating new combinations (Bercovitz and Feldman 2011). Reuse refers to the extent to which organisations innovate by reconfiguring and refining known technological combinations, while creation refers to the extent to which they innovate by creating new technological combinations. It is argued that the diversity of knowledge among inventors raises cognitive barriers that obstruct the flow of knowledge from where it is held to where it is needed. Because inventors have to develop solutions themselves, and because they are better equipped to make novel associations and linkages (Cohen and Levinthal 1990; Bercovitz and Feldman 2011), knowledge diversity stimulates innovation through recombinant creation.

An interesting theory on absorptive capacity comes from a study by Larrañeta et al. (2012) that investigates the moderating effect of absorptive

capacity on the relation between the diversity and novelty of external knowledge sources and strategic variety (a firm's range of competitive actions). Evidence is found for a direct positive relation between the novelty and diversity of external knowledge and strategic variety. However, the effect of absorptive capacity is less straightforward. Larrañeta et al. (2012) find that a highly developed absorptive capacity tends to homogenise the effect of diversity and novelty on strategic variety, weakening the relationship. The authors argue that there are upper limits to the potential gains from absorptive capacity and that above a certain threshold, it can oppose strategic variety because of a (too) well-developed ability to select and link different types of knowledge along well-known paths. These self-reinforcing habitual patterns of actions help an organisation to deepen its existing knowledge but not to engage in something new, and in the case of this study are not necessarily beneficial to strategic variety.

However, the most important notion to take away from absorptive capacity theory in relation to innovation is that a diversity of internal knowledge enables the assimilation and application of external knowledge as it occurs. This is also the link between absorptive capacity theory and the network theoretical concept of the strength of weak ties (Granovetter 1973, 1983). Kesidou and Snijders (2012) stress the importance of indirect ties and connections to nonlocal networks. Indirect ties or contacts are the connections one has through direct contacts. They build on Granovetter's (1973, 1983) work to explain that indirect ties are the channels through which distant ideas, influences or information may reach an actor. 'The fewer indirect contacts one has the more encapsulated he will be in terms of knowledge of the world beyond his own friendship circle', a state referred to as 'embeddedness' (Granovetter 1973, p. 1371). Indirect ties allow organisations to source a great diversity of information outside their inner circle of close relations and potentially provides a great source of new information, as the indirect tie itself could be embedded in another dense network of actors. Consistent with this theory, Kesidou and Snijders (2012) show that firms with indirect local ties demonstrate higher innovation performance than other firms in the same regional cluster. They also find that organisations linked to nonlocal knowledge networks (networks outside the regional cluster) demonstrate better innovation performance than those who do not.

The effect of ties to nonlocal knowledge in the form of inter-industry interlocks is twofold. First, ties with companies outside the focal company's industry increase a board's internal knowledge diversity as board members reside in multiple domains. Following absorptive capacity theory, this improves the board's ability to recognise and pursue innovation opportunities. Second,

inter-industry ties can be seen as the ties to nonlocal networks that contain a great variety of information. Inter-industry ties therefore increase both the availability of external information and the ability to take advantage of it. Thus we hypothesise:

H1 There is a positive relation between the number of inter-industry interlocks and innovation in terms of R&D expenditure.

Intra-Industry Interlocks

Coleman's (1988) social capital theory addresses the level of closure in a network. Maximum closure occurs when all actors in a network are interconnected (Aalbers and Dolfsma 2015). The higher the number of actual ties in a network in relation to the number of possible ties, the higher the level of closure (or network density). Social capital is quite an intangible concept as it relates to the value that is in the structure of relations between and among (corporate) actors. It relates to how actors can benefit from aspects of the social network around them. Coleman (1988) addresses three forms of social capital: social norms, obligations and expectations, and information channels. He argues that the social structure that best facilitates these three forms of social capital is network closure. Strong norms and values arise when a community is strongly inter-connected through network ties, enabling effective sanctioning mechanisms that reduce opportunistic behaviour. Social capital in the form of obligations and expectations relates to the trust between actors and the reciprocity of actions. Actors that have provided favours to others in the past can expect them to be reciprocated in the future. Social capital also occurs as the potential of information that is inherent in social relations. High levels of closure allow information to flow freely through a network, improving accessibility of information for all network actors. A synthesis of empirical literature by Zheng (2010) finds that all three of these forms of social capital can be positively linked to innovation.

The latter two points are also confirmed in a study by Laursen et al. (2012) which addresses the effect of regional social capital among manufacturing companies on the introduction of product innovations. They focus on the difference in social capital between different geographic regions and how this affects the effectiveness of internal and external R&D activities and the propensity to innovate. They argue that social capital enables innovation because it helps to connect people across organisations and to combine their knowledge. Increased trust enables the search for external knowledge and provides

organisations with learning opportunities on how to deal with managing outsourced R&D activities. Furthermore, social capital not only enhances the ability to recognise knowledge and opportunities on the supply side, it can also improve the understanding of local demands. The results support these theses, as a positive relation is found between the level of social capital and the introduction of product innovations.

Parra-Requena et al. (2015) investigate the effect of social capital on innovation within the Spanish footwear industry. Social capital here is operationalised as network density, trust between network actors and cognitive proximity. Cognitive proximity relates to the extent to which companies share goals and objectives, and have a common understanding of how an innovation should be established. They specifically focus on the role of knowledge acquisition and find that it is this variable that explains (mediates) the relation with social capital. They find that knowledge acquisition positively mediates the relation between trust and innovativeness and cognitive proximity and innovativeness. They argue that trust in itself does not adequately explain differences in innovativeness; it is rather the increased ability to obtain external knowledge, because actors are more willing to share as a result of trust, that explains innovativeness. The same is said for cognitive proximity, since a shared vision or set of values enables actors to identify and effectively communicate valuable knowledge.

Moving away from the initial phase of innovation generation or recognition, a study by Foss et al. (2013) focuses on the factors that underlie the successful development of a new (innovation) opportunity. They focus on the role of external knowledge and organisational design in successfully exploiting new opportunities and bringing them to market. The extent to which an organisation is able to recognise problems related to novel opportunities and is able to solve those is a function of external knowledge sources containing such information. One must think of industry-specific standards or certain production capabilities, for instance. Furthermore, they address the importance of the organisation's structure in bringing external knowledge into the organisation, specifically the decentralisation of decision making and the coordination of work flow. A significant three-way interaction shows that a combination of these two with the use of external knowledge has a positive effect on the exploitation of new opportunities. Although this does not directly relate to innovation in terms of generating new ideas, it does show that external knowledge, in combination with the right internal conditions of decentralisation and coordination, is crucial for developing and monetising those ideas.

Chen et al. (2013) endorse the effect of social capital, arguing that it helps to link the firm to critical information and resources in its environment. They find that board social capital enhances the counsel that a board can provide to its chief executive officer and drives their decision making towards a more R&D-oriented approach.

The effects of social capital may not all benefit innovation. Carnabuci and Operti (2013), for instance, also investigate the effect of collaborative integration on recombinant reuse and recombinant creation (innovation by reconfiguration and innovation by creation) and find that a dense network is not necessarily favourable to innovation. Collaborative integration is the extent to which a firm's inventors are part of one integrated intra-organisational network. The study finds that this embeddedness into the intra-organisational network increases recombinant reuse and decreases creation. An integrated network allows information to flow from those who possess it to those who need it, enabling reuse of existing combinations. If the intra-organisational network is more scattered, knowledge stays with those who developed it and inventors facing a new challenge are more likely to develop new solutions themselves. This corresponds to Geletkanysz and Hambrick's (1997) partial support for the hypothesis that intra-industry ties among top executives lead to strategic conformity. To put this in Granovetter's (1973, 1983) terms, intra-industry ties could lead to embeddedness into a group of industry peers, reducing the ability to look beyond industry boundaries due to a lack of connections to distant and diverse bodies of knowledge and thus reducing innovative capabilities. Uzzi's (1996, 1997) studies show results that support these negative effects of embeddedness in relation to firm performance. However, this is true only after a certain threshold. Until this threshold is reached, embedded firms have been shown to have a better chance of survival than firms that maintain 'arm's-length' market relationships.

This study proposes that intra-industry interlocks can be used to build a firm's social capital and embed it within its respective industry. These ties not only serve as channels for obtaining technical knowledge, but also provide the board with much needed market information, knowledge about competitors and suppliers and the needs of customers so that they can engage in efficient and effective allocation of resources to R&D activities. The effect of embeddedness is difficult to predict as its negative effect seems to only occur at high levels. Focusing mainly on the positive effects of social capital and low levels of industry embeddedness through intra-industry interlocks, our second hypothesis is formulated as follows:

H2 There is a positive relation between the number of intra-industry interlocks and innovation in terms of R&D expenditure.

Moderation Effect

Considering the predicted possible negative consequences of high levels of industry embeddedness related to high numbers of intra-industry interlocks such as the inability to look outside industry boundaries, it could be argued that this effect can be counteracted by means of inter-industry interlocks, as these link the organisation's board to companies outside the respective industry. There might exist a symbiotic effect between inter- and intra-industry interlocks, as the former can reduce the negative consequences related to the latter. An organisation's board can benefit from ties to external bodies of knowledge, high levels of absorptive capacity and industry-specific knowledge without the negative consequences of industry embeddedness. In other words, the number of inter-industry interlocks might alter the relationship between intra-industry interlocks and innovation. Considering the former, it is expected that the effect on this relationship of inter-industry interlocks is positive, and thus strengthens it. This means that a positive moderation effect is expected of inter-industry interlocks on the relation between intra-industry interlocks and innovation. This results in the third hypothesis:

H3 Inter-industry interlocks positively moderate the relation between intra-industry interlocks and innovation in terms of R&D expenditure in a way that the relation becomes more positive as the number of inter-industry interlocks increases.

Figure 15.3 depicts the hypothesised relations between corporate board interlocks and innovation and control variables considered.

Methodology

Data Collection Procedure

A panel dataset of 20 companies for the years 2007 through 2015 is composed using the company information database Orbis. The Orbis database comprises a firm-level global panel dataset for public and private companies based on the administrative micro-dataset Orbis, provided commercially by

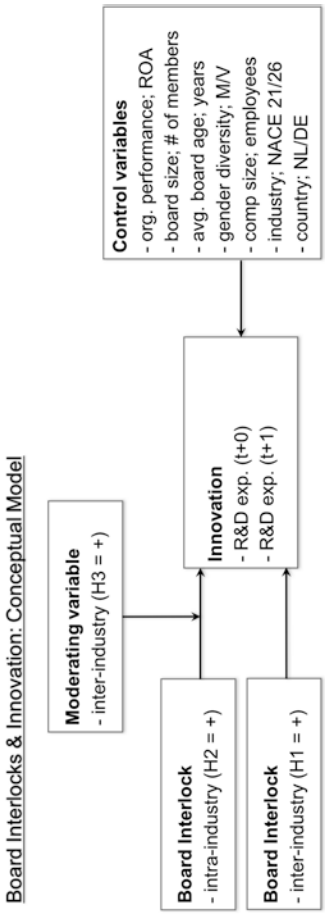

Fig. 15.3 Conceptual model for the relation between board interlocks and innovation

Bureau van Dijk Electronic Publishing (BvD). The database provides data on firms' financial and productive activities from balance sheets and income statements together with detailed information on firms' domestic and international ownership structure. First, the top 250 companies from industry 21 and 26 are selected based on operating revenue in the year 2015. Subsequently, companies are excluded from the sample if the required data on R&D, return on assets (RoA) and employee numbers is not available for one of the given years, if the last available year of data is earlier than 2015 or if R&D expenditure in one of the given years is zero. Of the remaining 67 companies, one company is extracted because its parent company is also in the list and two others because they are post box firms with headquarters not residing in the Netherlands. Lamb and Roundy (2016) address the need for sample diversity in board interlocks research, as the majority of studies are executed among firms in the USA. Therefore, the sample for this chapter is constructed using high-tech companies solely from the Netherlands and Germany. Institutionally these countries are quite alike as they both are coordinated market economies which, for instance, require organisations to have two-tier board structures. According to Nomenclature statistique des activités économiques dans la Communauté européenne (NACE) Rev. 2 (Eurostat 2008), the high-tech aggregation includes NACE Rev. 2 codes 21 (manufacture of basic pharmaceutical products and pharmaceutical preparations) and 26 (manufacture of computer, electronic and optical products). Typically, the high-tech industry is characterised by high patenting frequency (Ahuja 2000), the existence of many strategic alliances and high levels of R&D expenditure (Stuart 2000), which makes the industry suitable for measuring the dependent variable.

Information on the organisations' board members was taken from annual reports which provide information on external directorships in each year, including board members' age and gender. Orbis is again used to classify the industries of the companies with which the respective board members are interlocked. In cases where the annual reports are inconclusive about age or gender, Bloomberg.com's executive profile pages provide a solution. Nine years of data from 2007 through 2015 is collected for 20 companies, resulting in a sample size of $n = 180$; however, not all companies provided the required information in their annual reports in all years. Therefore, the total number of useable observations results in $n = 160$ before and $n = 158$ after outlier analysis for the $t + 0$ analysis and $n = 141$ for a lagged $(t + 1)$ analysis. The sample size determines the statistical power of the analysis and the generalisability of the results. In the case of multiple regression, the preferred method of analysis, a sample size too small ($n < 30$) allows only for finding a strong relationship with one independent variable. If the sample size is very large ($n > 1000$), any relationship can be statistically significant. Depending

on the strength of the relationship that is expected between the dependent and independent variables, the significance level (α) chosen and the required statistical power (the probability of detecting a statistically significant specific level of R^2), the required sample size can be determined. In order to obtain a statistical power of 0.80 (R^2 is detected in 80% of the times it occurs) and to identify fairly weak relationships (R^2 = 5 through 15) with a significance level of α = 0.05 using five to ten independent variables, requires somewhere between 100 and 250 observations (Hair et al. 2014). The sample size furthermore determines the generalisability of the results by the ratio of observations to independent variables. The minimal ratio is five to one, however the desired level lies somewhere between ten and 20 to one. Given that the sample sizes are 158 and 141, and that the number of independent variables (including the interaction effect) in each analysis is ten, the ratios are 158/10 = 15.8 and 141/10 = 14.1, which are both well within the desired range.

Dependent Variables

The innovativeness of an organisation's board, on the scale of this chapter, is quite difficult to measure directly. Therefore, a number of proxy variables have been considered for this purpose. For instance, Ahuja (2000) uses the yearly patenting frequency of organisations in the chemical industry as a measure for innovative capacity. It is argued that the patenting frequency is an adequate measure for that particular study since all companies belong to the same industry in which applying for patents is a common practice. The number of acquired patents reflects how successful the entire organisation has been in developing and securing new ideas. A study by Ritter and Gemünden (2003) measures innovation success by means of product and process innovation rates. This is the percentage of sales that comes from products less than three years old and the percentage of production that is executed using facilities less than three years old. The latter in particular is a very direct way of measuring the financial success that comes from new products. The problem with both patenting frequency and innovation rates is that they are dependent on much more than the board's strategic decision-making process. They reflect the success of the innovative endeavours of the entire organisation and not the commitment to innovation at the level of the board. A solution is found in studies, for instance, by Midavaine et al. (2016) and Chen et al. (2013) where a firm's R&D expenditure (as a percentage of total sales) is used to measure the board's commitment to innovation. Especially when compared over multiple years and between multiple companies, R&D expenditure gives a good

representation of a board's propensity to innovate since the (strategic) allocation of resources follows directly from the board's decision-making process.

However, the Organisation for Economic Co-operation and Development (OECD) and Eurostat (2005) argue that R&D (expenditure) is merely one step in the innovation process. Other activities that should be considered as belonging to the innovation process include development for preproduction, production, distribution, support activities including training and market preparation, and finally the development and implementation of mew marketing and organisational methods. When studying the innovative capacity of one organisation or the innovation process itself in detail, all these activities should be included. However, this chapter focuses on the effect of board interlocks on innovative decision making by comparing multiple companies over a longer period of time, not the outcomes of innovation or the process itself. Furthermore, the development of R&D spending is an indicator that is easily accessible from public sources and represents how the board's actual commitment to innovation varies over time. Therefore, for the specific purpose of this chapter, it is a suitable variable for measuring innovation.

Independent Variables

The number of interlocks is determined by checking whether board members hold positions with other companies. Following Heemskerk (2007), board positions at companies within the same holding company are not classified as interlocks. Moreover, multiple interlocks between one person and multiple companies belonging to the same parent company are counted as only one interlock. Furthermore, only positions on executive and supervisory boards of two-tier boards and (non)executive directorships on one-tier boards are counted as interlocks. This means that positions on shareholder committees, boards of trustees, (trade) unions, works councils, governmental organisations, foundations, museums and universities are not included in the sample.

The inter- and intra-industry interlocks are compiled by checking whether each interlock is with a company within or outside of the focal industry based on the two-digit NACE Rev. 2 code (Eurostat 2008). Interlocks with companies from industries other than the focal industry are categorised as intersector. Moreover, interlocks from 21 to 26 and vice versa are categorised as inter-industry interlocks. All others are intra-industry interlocks. In cases where companies are active in more than one industry, they may have multiple secondary industry codes. In all cases, the two-digit primary code that

represents the industry in which the company generates the majority of its revenues is used.

A moderation effect of inter-industry interlocks on the relation between intra-industry interlocks and innovation is tested by creating an interaction term of inter- and intra-industry interlocks. In order to do so these variables are centred around their mean.

Control Variables

Given the fact that the sample consists of companies from two different countries and industries, both of these variables are included in order to control for potential institutional differences. As firm performance might influence strategic decisions by the board to either divest or invest in R&D (Chen et al. 2013), the firm's RoA is included as a variable to control for these effects. RoA before taxation is used rather than RoA in order to account for the different fiscal environments of the Netherlands and Germany.

Board size (the total number of board members) is included, as Goodstein et al. (1994) show that large boards face a number of barriers for resolute decision making such as low cohesion and decreased motivation as a result of lack of participation.

A study by Midavaine et al. (2016) finds that division between male and female board members is positively related to R&D expenditure. In order to control for this effect, gender diversity is included as a control variable using Blau's index of heterogeneity using the formula: $1-\sum \rho_i^2$ in which ρ_i is the proportion of group members in each of the *i* categories. In the case of two categories (male/female), perfect heterogeneity (as many males as there are females on the board) is represented by the number 0.5. Absolute homogeneity (only males or only females) is represented by the number zero.

Further, average board age is included as a control variable as tenure is found to be positively (Wu 2014) as well as negatively (Chen et al. 2013) related to innovation. It must be mentioned, however, that especially for German companies, it is quite often not possible to obtain information about the ages of all board members. Often only the ages of executive board members are listed in annual reports. In addition, in Germany, members of the works councils are also members of the supervisory boards. These individuals are less known in the corporate world and as such often do not have a Bloomberg executive profile. Therefore, the average board age quite often is determined based on incomplete information.

Finally, the company's size in terms of number of employees is included as a control variable as larger firms might possess more resources to direct towards innovation (Barker III and Mueller 2002).

Analysis

Model Specification

A lagged hierarchical moderated Ordinary Least Squares (OLS) regression is applied as our method of analysis, as this dependence technique allows for analysing one dependent variable with multiple independent (predictor) variables. Standard assumptions of linear regression are all met.

Two separate hierarchical moderated multiple regression analyses are performed in order to study the relation between the independent variables and R&D expenditure. First, the effects are tested when R&D expenditure is measured in the same year ($t + 0$) as the independent variables as a baseline model. The main analysis comprises a lagged regression that tests the effect of the independent variables on R&D expenditure when measured one year after ($t + 1$) the independent variables. R&D expenditure is a strategic choice that follows from strategic planning decisions made by the board. The effect of strategic decisions does not occur instantaneously, therefore results of strategic decisions are often measured with a time delay between the dependent and independent variables (Chen et al. 2013; Geletkanycz and Hambrick 1997; Yoo and Reed 2015).

Results of $t + 1$ Analysis

Table 15.1 contains the descriptive statistics and correlations of all the variables used in this analysis. There are weak to moderate significant correlations between the dependent variable and most of the independent variables. Only gender diversity and country do not seem to correlate with the dependent variable. Further, there is no correlation greater than 0.9, meaning multicollinearity is not an issue here.

Table 15.2 reports the results of the lagged hierarchical multiple regression analysis and presents the predictive power of the tested models. The first model contains all the control variables. The isolated effects of inter- and intra-industry interlocks are examined in models 2a and 2b respectively, while the combined and moderated effects are entered in models 3 and 4.

Table 15.1 Descriptive statistics and correlations of $t + 1$ analysis

		Mean	St. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.	R&D expenses / Operating revenue % ($t + 1$)	9.45	5.37	–									
2.	ROA using P/L before tax %	5.27	9.40	−0.35***	–								
3.	Total number of board members	14.30	5.40	−0.27**	0.06	–							
4.	Average board age in corresponding year	56.48	3.74	−0.27**	0.12	−0.03	–						
5.	Gender diversity	0.18	0.13	0.07	−0.01	0.07	0.38***	–					
6.	Number of employees (Log10)	3.91	0.63	−0.42***	0.10	0.63***	0.25**	−0.02	–				
7.	Country (NL dummy)	0.28	0.45	0.11	−0.06	−0.44***	0.30***	−0.01	0.04	–			
8.	Industry (NACE Rev. 2 primary code)	24.65	2.23	0.15*	−0.08	−0.32***	−0.34***	−0.43***	−0.33***	0.10	–		
9.	Number of inter-industry interlocks	15.99	10.33	−0.18*	0.00	0.67***	0.09	−0.04	0.62***	0.11	−0.44***	–	
10.	Number of intra-industry interlocks	1.45	1.79	0.40***	−0.14*	−0.10	−0.12	−0.17*	0.00	0.18*	0.02	−0.02	–

Note: Pearson correlations are reported. $n = 141$. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 15.2 Results of hierarchical multiple regression analysis: Effects on R&D expenditure (t + 1). The standard errors and significance levels are based on 2000 bootstrap samples

	R&D expenses / Operating revenue % (t + 1)				
	Model 1	Model 2a	Model 2b	Model 3	Model 4
Intercept	*43.95***	*43.45***	*35.93***	*33.14***	*32.95***
	(8.92)	*(10.30)*	*(7.54)*	*(8.21)*	*(8.17)*
Control variables					
ROA using P/L before tax %	**–0.27****	**–0.27****	**–0.26****	**–0.22***	**–0.22***
	–0.15	*–0.15*	*–0.13*	*–0.12*	*–0.12*
	(0.05)	*(0.05)*	*(0.05)*	*(0.05)*	*(0.05)*
Total number of board members	**0.06**	**0.03**	**0.08**	**–0.04**	**–0.04**
	0.06	*0.03*	*0.08*	*–0.04*	*–0.04*
	(0.11)	*(0.18)*	*(0.10)*	*(0.16)*	*(0.16)*
Average board age in corresponding year	**–0.28****	**–0.27****	**–0.22****	**–0.21****	**–0.21****
	–0.40	*–0.40*	*–0.31*	*–0.29*	*–0.29*
	(0.13)	*(0.14)*	*(0.10)*	*(0.11)*	*(0.11)*
Gender diversity	**0.15**	**0.15**	**0.21****	**0.24****	**0.25****
	6.13	*6.41*	*8.61*	*10.09*	*10.25*
	(3.17)	*(3.67)*	*(2.89)*	*(3.43)*	*(3.61)*
Number of employees (Log10)	**–0.38****	**–0.37****	**–0.39*****	**–0.39****	**–0.39****
	–3.17	*–3.16*	*–3.28*	*–3.27*	*–3.28*
	(0.94)	*(0.95)*	*(0.88)*	*(0.92)*	*(0.90)*
Country (NL dummy)	**0.22***	**0.21**	**0.15**	**0.07**	**0.07**
	2.67	*2.48*	*1.81*	*0.85*	*0.85*
	(1.01)	*(1.64)*	*(0.98)*	*(1.53)*	*(1.53)*
Industry (NACE Rev. 2 Primary code)	**–0.03**	**–0.02**	**0.03**	**0.08**	**0.08**
	–0.06	*–0.04*	*0.06*	*0.20*	*0.20*
	(0.21)	*(0.29)*	*(0.19)*	*(0.25)*	*(0.26)*
Predictor variables					
Number of inter-industry interlocks(centred)		**0.03**		**0.15**	**0.15**
		0.02		*0.08*	*0.08*
		(0.09)		*(0.08)*	*(0.08)*
Number of intra-industry interlocks (centred)			**0.36*****	**0.37*****	**0.38*****
			1.08	*1.12*	*1.13*
			(0.20)	*(0.20)*	*(0.21)*
Moderation effect					
Inter*intra (centred)					**–0.02**
					–0.01
					(0.03)
R^2	**0.342**	**0.342**	**0.459**	**0.465**	**0.465**
R^2 adjusted	**0.307**	**0.302**	**0.427**	**0.428**	**0.424**
	(4.47)	*(4.48)*	*(4.06)*	*(4.06)*	*(4.07)*
ΔR^2 adjusted		**–0.005**	**0.125*****	**0.126*****	**–0.004**
F-ratio	**9.87*****	**8.85*****	**14.02*****	**12.64*****	**11.30*****

Standardized, *unstandardized* regression coefficients and *(std. errors)* are reported.
n = 141. *p < 0.05, **p < 0.01, ***p < 0.001

Model 2a shows that the isolated effect of inter-industry interlock is insignificant ($\beta = 0.03$; $p = 0.85$), meaning that there is no support for hypothesis 1. The effect of intra-industry interlock, isolated in model 2b ($\beta = 0.36$; $p<0.001$), model 3 ($\beta = 0.37$; $p < 0.001$) and model 4 ($\beta = 0.38$; $p < 0.001$), is positive and significant, thus fully supporting hypothesis 2. Model 4 shows that there is no support for hypothesis 3 as there is no significant effect ($\beta = 0.02$; $p = 0.82$) for the moderation term of inter- and intra-industry interlocks.

The control variables in model 1 together explain 30.7% of the variance in the dependent variable with an F-ratio of 9.87. The best models in terms of predictive power are models 3 and 2b, which explain 42.8% and 42.7% of the variance in the dependent variable respectively. Considering the F-ratios and standard errors of both models, model 2b outperforms model 3 given that it has a higher F-ratio, of 14.02 (as opposed to 12.64). Furthermore, the standard errors are somewhat lower for the control variables in model 2b. Almost a third of the total variance explained by model 2b comes from the variable intra-industry interlocks, as it alone counts for 12.5% of the variance explained.

Surprisingly, no significant result was found for the effect of inter-industry interlocks on R&D expenditure or for the moderation effect of inter-industry interlocks on the relation between intra-industry interlocks and R&D expenditure.

The fact that no significant moderation effect was found means that the two variables do not interact with each other in relation to the dependent variable. From a statistical point of view this makes sense, considering the very small and highly insignificant effect of inter-industry interlocks ($\beta = 0.03$; $p = 0.85$) and the fact that the variable contains no significant explanatory power ($R^2 = -0.005$). The only way in which the moderation effect could have been significant, given the insignificant moderator, would have been a cross-over interaction. In this case the outcome on the dependent variable depending on the isolated effect of inter-industry interlocks would strongly differ for low and high levels of intra-industry interlocks. A strongly insignificant and very small moderation term ($\beta = 0.02$; $p = 0.82$) indicates, however, that this is not the case.

In order to check the robustness of the insignificant moderation effect, another regression is performed in which all control variables are excluded. The isolated effect of inter-industry interlocks now becomes negative (opposite to hypothesis 1) and significant ($\beta = -0.18$; $p = 0.01$) but still only explains 3.2% ($R^2 = 0.032$) of the variance in the dependent variable. The regression coefficient (β) becoming negative makes sense given that the significant

control variables are all negatively related to the dependent variable. Although the moderating variable is now significant, the moderation term still is not ($\beta = 0.03$; $p = 0.60$). Therefore, it must be concluded that there is no interaction whatsoever between the number of inter- and intra-industry interlocks.

Discussion and Limitations

The knowledge management literature readily provides a deep understanding of knowledge creation within and between firms, as also postulated throughout this volume. Within this domain, innovation is commonly positioned as the holy grail of the business world, driving processes of change which are exploited by successful organisations to deliver profitable revenue growth (Aalbers and Dolfsma 2015). In order to profit from innovation, however, it is vital that the concept of networks is understood, that is, the networks at corporate board level that connect leadership between associated players in a common industry. This chapter contributes to the current understanding in this field by zooming in on an aspect that has been topical on the agendas of many corporations that strive for corporate-level competitive advantage through innovation—yet has remained somewhat lacking in scholarly attention: the corporate governance mechanisms that may, from the top down, facilitate or obstruct the inclination to innovate, operationalised in this chapter in terms of dedicated R&D expenditure. In fact, recent work on board interlocks has started to acknowledge the organisational benefits to board interlocks in relation to better operational performance and improved financial returns, yet a more fine-grained understanding of the benefits and costs of board interlocks and inter-firm knowledge exchange is needed (Grigoriou and Rothaermel 2017). This chapter specifically explores whether such benefits also relate to innovative knowledge being transferred. Indeed, the corporate board is a prime organisational design mechanism that, as our findings indicate, holds direct relevance for the extent of innovative knowledge being absorbed by a firm, although only under specific configurations. Drawing on knowledge management and social network literature, we examine the relation between corporate board interlocks and a board's commitment to innovation. As suggested by social capital theory, we argue and find that being relationally well embedded across the organisational upper echelons across one's industry improves the board's ability to recognise and pursue innovation opportunities. The literature so far has not been outspoken on the distinction between the industrial boundaries that are being abridged by board interlocks. The findings of this chapter partially suggest

that corporate board interlocks can indeed serve as the channels through which important information flows to an organisation's board. In other words, interlocks are a way to manage an organisation's resource dependency. Being able to dispose of the right resources is critical to innovation. These intra-industry ties, positioned within a relatively familiar knowledge domain—that is, one's own industry—further serve as the connections to nonlocal networks that contain a great variety of information. Intra-industry ties therefore increase both the availability of external information and the ability to take advantage of it, here operationalised as the inclination to invest in innovation in terms of R&D expenditure. Such knowledge domains are potentially different from the current knowledge base of the firm yet, as near adjacencies, still easily interpretable at board level. However, we did not find any empirical evidence supporting our reasoning on the presumed effect of interlocks with companies residing outside the focal industry, in other words the inter-industry interlocks. Our findings on the role of intra-industry interlocks in relation to innovative knowledge exchange link social capital, via the intra-industry embeddedness at the board level, to R&D expenditure, underscoring the importance of social capital. In the context of high-tech collaborative arrangements, we highlight the R&D expenditure of a firm to depend upon not only their established knowledge base, but also how this knowledge base is governed, suggesting the role of top-down corporate board interlocks as coordination mechanisms to forge innovative knowledge exchange and implementation.

Intra-industry interlocks are an instrument for more formally building a firm's social capital within its own industry. These ties not only serve as channels for obtaining technical knowledge, but also provide the board with much needed market information, knowledge about competitors and suppliers and the needs of customers. Although industry embeddedness might have negative consequences when it occurs in high levels, in low levels its effects should be mainly positive. Intra-industry ties can be seen as a means to identify what is important in an organisation's direct environment and as such increase the ability to recognise and engage in opportunities for innovation. The near adjacency of the knowledge being tapped allows for readily interpretable inputs. Our empirical results support these claims as we find that a positive relation exists between interlocks with companies residing inside the focal industry and R&D expenditure. These findings strengthen the existing literature on social capital in relation to innovation. The fact that the result for intra-industry ties is significant and that of inter-industry ties is not, gives reason to think about which ties are important. This finding also relates to recent insights on how to organise for knowledge generation by Grigoriou and

Rothaermel (2017), who find that managers tasked with innovative knowledge generation should carefully weigh the benefits of external sourcing, as ideas such as external sourcing potential may be overstated in relation to a more closely related search, or even a within-firm search, for future competitive advantage. We suggest that boards and board members should consider which resources are important for their organisations given their strategy and the resources they require, and manage their ties accordingly. In times of innovation, intra-industry ties serve as channels for obtaining knowledge and furthermore provide the board with market information about competitors, suppliers and the needs of customers. They strengthen an organisation's position within its environment and connect it to the multiple resources needed for innovation. Organisations looking for ways to improve their innovative capabilities can benefit from managing the configuration of their corporate board ties. From a knowledge management perspective, therefore, it can be concluded that intra-industry ties are in fact a means to organise for innovative knowledge transfer. From a theoretical point of view, however, it is hard to determine why there is no significant relation between inter-industry interlocks and R&D expenditure. Recent work on corporate board composition in relation to R&D-driven innovative capability, for instance, finds that boards that can tap into a diversity of sources for information can be expected to make better decisions (Midavaine et al. 2016). Board diversity can nonetheless also impede team performance. Diversity in terms of board member tenure, for instance, has been linked to firms performing less innovatively, while education diversity and gender diversity in the boardroom spur innovativeness (Midavaine et al. 2016). This chapter contributes to the discussion on board diversity in relation to innovative knowledge transfer and the scope of the associated search (intra-industry or inter-industry) by focusing not merely on the diversity among board members themselves, but rather on the sources from which members obtain their knowledge. Our findings may imply in that regard that ties to nonlocal knowledge and absorptive capacity do not influence a board's R&D expenditure and thus its commitment to innovation. It is more likely that inter-industry interlocks are a poor representation of these two theoretical concepts given that they have been related to innovation in many previous studies. We did not look, for instance, into the actual value attributed to the knowledge being exchanged, nor did our data allow us to provide a more fine-grained indication of the absorptive capacity mechanisms in place at firms that performed better than others. Another explanation could be that the content and context of the domains might differ too much. As explained in absorptive capacity theory, in order for valuable information to be recognised as such, it must relate to something that is already known.

Information that flows through inter-industry ties might differ too much from relevant intra-industry information to be of value. Relatedly, information-based diversity, defined as diversity concerning the originating sources of inputs being discussed in the boardroom, that is, ideas being carried through from other industries, might give rise to a more difficult exchange of viewpoints between board members. Moreover, the nonconformity of such ideas may be harder to translate into the organisation. In other words, knowledge that is taken for granted in one industry may not be equally acceptable or acknowledged when board members have diverse backgrounds (Cramton and Hinds 2004). Additionally, it may face the knowledge transfer issues frequently associated with tacit knowledge exchange as board members attempt to convey ideas that are nonstandard in one industry from another industry. Thus, while the knowledge management literature suggests that information-based diversity at board level ensures a variety of sources of knowledge on which its members can draw (Paulus 2000; Reagans and McEvily 2003; Woodman et al. 1993), the knowledge source seems to matter for the degree to which such diversity fuels actual innovative knowledge exchange.

Addressing the insignificant moderation effect of inter-industry interlocks on the relation between intra-industry interlocks and innovation, it must be noted that the presumed negative effects of embeddedness related to intra-industry interlocks might not have occurred in this chapter given the relatively low number of intra-industry interlocks in the sample. The average number of intra-industry interlocks is 1.45 (with a maximum of 9) against an average of 15.99 inter-industry interlocks (with a maximum of 60). If the number of intra-industry interlocks had been higher, the negative effects of embeddedness might have occurred. In that case a high number of ties outside the focal industry might have positively interacted with the intra-industry ties, resulting in a significant interaction.

The main limitation of this chapter is the use of a proxy variable in order to measure innovation at the level of the board. Ideally it would be measured more directly by determining the perceptions and beliefs regarding innovation of individual board members. On the scale of this quantitative study, this would require an incredible amount of time and the cooperation of many organisations. Such an approach therefore better suits a smaller-scale qualitative study. Another concern about the dependent variable is that it is not entirely under the influence of the board as a strategic decision. Although the decision to invest a certain amount in R&D is made by the board, the ratio of R&D divided by sales depends on the amount in sales that is actually generated. Although budgets are made using sales forecasts, the actual level of sales depends on market conditions and is somewhat outside the control of the

board. This chapter takes quite a narrow view of the concept of corporate ties by only looking at interlocks between boards. Of course, this was done for of practical reasons as these types of connections are identifiable only using public sources. However, many other ties, such as noncorporate and friendship ties, exist as well and are also an interesting subject of study. These, however, are much more difficult to map merely using public sources. Future research in this area might also want to focus on the actual innovative behaviour of boards and board members. The focus therefore might have to shift from firm-level to director-level in order to identify innovative behaviour on an individual level. The question to be answered is how a director's ties influence his or her innovative behaviour and what influence this has on the strategic decisions made by the board.

For this chapter, we considered using the proportion of interlocks, relative to board size, as an independent variable. However, the number of interlocks that each board member can have is (theoretically) unlimited and in that way is independent of board size. Further, considering the theoretical framework, the effect of interlocks is sought in what the ties themselves represent. Therefore, only the absolute number of interlocks was used as a variable. It would be interesting, however, to use the number of interlocks relative to board size, as this gives an indication of how individual board members are connected outside the focal company. This would shift the focus somewhat from firm-level to the level of the individual director.

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16

Knowledge Sharing Across National Cultural Boundaries and Multinational Corporations

Jakob Lauring and Ling Eleanor Zhang

Introduction

In the global marketplace, competitive advantage no longer comes only from efficient methods of production and delivery but also comes from having the right knowledge (Lauring 2009; Porter and Kramer 2002; Smith et al. 2005). Therefore, the ability to mobilize and deploy knowledge repositories and knowledge flows is now seen as a key driver of organizational performance (Kogut and Zander 1992; Kuzu and Özilhan 2014; Sheng and Hartono 2015). This makes corporations' ability to share and integrate knowledge in organizational departments and across different business units a vital capability for developing a competitive edge (Argote et al. 2000).

While the sharing of knowledge is important to all businesses, it has been found to be particularly so for multinational corporations (MNCs) (Doz 2006; Gupta and Govindaranjan 2000; Szulanski 1996). MNCs are international networks that create, exchange and apply knowledge in multiple locations (Almeida and Phene 2004; Sohail and Daud 2009). Accordingly, these organizations can be described as being diverse and dispersed entities (Ghoshal and Westney 1993).

J. Lauring (✉)
Department of Management, Aarhus University, Aarhus, Denmark

L. E. Zhang
School of Management and Business, King's College London, London, UK

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Both diversity and dispersion can increase the value of knowledge sharing. This is because the MNC can create, combine and exploit knowledge across a variety of different geographical and cultural contexts (Lauring and Selmer 2012b; Stahl et al. 2010). The advantages of this dispersion include wider opportunities to bring relevant external knowledge into the firm and the capacity to integrate unique and valuable internal knowledge on a global scale, contributing to value creation and competitive advantage (Michailova and Minbaeva 2012). As such, the ability of an MNC to survive in today's global business environment is closely related to its competencies in utilizing variations in knowledge, perspectives and expertise around the world. This can be in the form of exploiting existing knowledge stocks or combining them to create new knowledge. MNC knowledge sharing has, for example, been linked to the development of new products (Hansen 1999), the leveraging of best practices in various locations (Kostova and Roth 2002; Szulanski 1996) and the realization and use of innovations in different units (Tsai 2001; Tsai and Ghoshal 1998).

However, because the effective use of knowledge to a great extent depends on the motivations for knowledge sharing, understanding the role of social and sociotechnical factors in sharing ideas and information is central to MNC functioning. It is clear that knowledge does not flow without restrictions across cultural, linguistic and geographical boundaries in MNCs. Hence, the diversity and dispersion that is essentially a potential benefit for MNCs is also an important barrier for knowledge sharing. This creates a central paradox for managers to deal with. To understand this better, there is a need for more insight into the social and sociotechnical factors influencing knowledge sharing behaviour in MNCs. Accordingly, the main aim of this chapter is to explore the diversity and dispersion linking social and sociotechnical factors to knowledge sharing barriers between and within MNC units.

Knowledge Sharing, Social and Sociotechnical Factors

Knowledge sharing takes place when individuals exchange relevant information, ideas and perspectives (Srivastava et al. 2006). Consequently, it entails careful transmission by the sender and careful absorption by the receiver to be effective (Sohail and Daud 2009). As such, knowledge sharing is a relational act based on a sender–receiver relationship, which incorporates the voluntary communication of one person's knowledge to others as well as the receiving of other persons' knowledge (Minbaeva and Michailova 2004; Van den Hooff

and de Leeuw van Weenen 2004). Hence, the effectiveness of knowledge sharing is influenced by both the characteristics of the specific knowledge and the properties of the sender, the receiver (social factors) and the transmission channel (sociotechnical factors) (Argote 1999; Argote and Ingram 2000; Boh and Wong 2015).

Social factors, such as culture and language, that can influence social relationships naturally affect knowledge sharing in organizations (Gross and Kluge 2014; Jeon et al. 2011; Lee et al. 2014). The more social ties and better social relationships there are between individuals, the more knowledge sharing behaviour is likely to occur between a sender and a receiver (Gross and Kluge 2014; Nielsen et al. 2011). Therefore, prosocial commitment has also been found to be an important predictor of knowledge sharing behaviour (Tseng and Kuo 2014). In this regard, the desire to improve inter-personal relationships has been found to be a main motivator for knowledge sharing (Fullwood et al. 2013). He and Wei (2009) reached a similar conclusion when they studied knowledge contribution and knowledge seeking in an international information technology (IT) company in Hong Kong: Employees who contributed to the organization's knowledge management system did so because of their social relationships with coworkers, not because of other motivations such as reciprocity or financial rewards. Social motivation is thus one of the most important social factors for knowledge sharing behaviour to take place (Javernick-Will 2011).

In a similar vein, more socialization within an organization would also increase the depth and range of knowledge sharing (Biswanath Dutta et al. 2015; Gross and Kluge 2014). Developing more social relations has a direct positive effect on the quantity of knowledge shared (Lee et al. 2014). Scholars also found that social interaction, and in particular trust built on social interaction, influenced the quality of shared knowledge—not least in Asia (Chang and Chuang 2011). Mutual trust between employees increases workplace interaction and communication and thus leads to more knowledge sharing within organizations. The trust and relationship building found to increase knowledge sharing, however, is also greatly affected by different technical circumstances. This is specifically important in MNCs where IT often must be applied in order to communicate. Interaction over the telephone, e-mail or chatrooms will render it difficult to develop the good relations and trust necessary for effective knowledge sharing to take place. Accordingly, social and sociotechnical factors can play a significant role in any organization but not least in MNCs. Next, we discuss in detail how the social and sociotechnical factors influenced by diversity and dispersion of MNC operations affect knowledge sharing.

Diversity in MNCs

Cultural diversity and linguistic diversity are the two types of diversity in MNCs that originate from the international environment and thus make them different from domestic organizations. It is therefore crucial to understand how knowledge sharing can take place effectively in culturally diverse organizations such as MNCs. Cultural diversity describes heterogeneity in basic core values, beliefs, customs and rituals, as well as heterogeneity in legal, political and economic systems (Adler 2008; Shenkar 2001). Linguistic diversity, on the other hand, can be conceptualized as the presence of a multitude of speakers of different national languages in the same work group (Lauring and Selmer 2012a, c, 2013b). Diversity in languages is both related to and differentiated from cultural diversity in important aspects. Different language groups, for example, may hold relatively similar values (e.g., Swedish- and Finnish-speaking Finns), and national groups may be very different while speaking the same native language (e.g., English speakers in the USA and India) (Selmer and Lauring 2015).

Diversity within MNCs has been argued to have a positive impact on performance by bringing a broader range of knowledge and experience to the group (Park and Overby 2012; van Knippenberg et al. 2004). Diversity originating from having different backgrounds may offer complementary information and skills (Hambrick et al. 1998). In other words, international knowledge sharing should be more valuable than knowledge sharing in a more homogeneous group because members are more likely to encounter unique knowledge that has not previously been shared. Yet research has repeatedly shown that challenges resulting from diversity hamper knowledge sharing behaviour (Boone and Hendriks 2009; Harrison and Klein 2007).

The challenges diversity creates for knowledge sharing within MNCs have often been analysed from the theoretical perspective of similarity-attraction (Webber and Donahue 2001). According to the similarity-attraction hypothesis (Byrne et al. 1966), individuals are interested in interacting with one another primarily based on similarity of attitudes, appearances and behaviours. The more similarities there are, the more likely inter-personal attraction is to occur, which leads to more frequent social interaction between individuals. They will thus be more likely to share knowledge (Mäkelä 2007). When individuals tend to interact with those who are similar to themselves, it is more difficult for distinct group members to build trust and either receive or send knowledge to the rest of the group. Because of dissimilarities, distinct members are also more likely to be socially excluded from useful information

networks. This will lead to less group involvement and group interaction, which is the key to knowledge sharing (Lauring and Selmer 2013a). For example, Ravu and Parker (2015) discovered that local employees in an African context were reluctant to share knowledge with expatriate colleagues because they perceived expatriates to be incompetent. Expatriates viewed local colleagues in the same way and thus did not initiate any knowledge sharing. Similarly, Zhang and Peltokorpi (2016) found that host-country language proficiency functioned as an important barrier reducing interaction between Nordic expatriates and Chinese locals (see also Lauring 2008; Zhang and Harzing 2016). Voelpel and Han (2005) studied knowledge sharing in a Chinese subsidiary in Siemens. Here they also found that insufficient English language skills made Chinese employees reluctant to contribute to the knowledge management system and to read the manual for the system. This was especially a problem for lower-level managers. Voelpel and Han (2005) also found cultural barriers for Chinese individuals using the knowledge management system; the fear of losing face (e.g., due to language problems) and the reluctance to share knowledge with out-group members were specifically mentioned. Chow et al. (2000) also found cultural difference in knowledge sharing behaviour when comparing Chinese and American MNC employees. Their results demonstrated that if private knowledge had no potential to damage the sharer's self-interests, there was no significant difference between Americans and Chinese organization members. Yet, when assessing information that could potentially damage the sharer's self-interests while benefiting the company, the Chinese respondents indicated a significantly higher propensity to share. They would thus place more emphasis on the collective. The Chinese were also significantly less inclined than their counterparts in the USA to share knowledge with other individuals who were considered out-group members.

As indicated above, employees working in a new cultural environment—be it a new office in another country or the same office with new members from other cultures—have a tendency to withdraw socially from the unfamiliar elements. This makes it difficult for expatriates and local employees to foster trust in one another, which is important in order for knowledge sharing to occur. Hence, diversity in culture and language, which can also be a potential benefit, will generally have a negative influence on knowledge sharing behaviour. Diversity, however, is not the only factor that can create knowledge sharing challenges in MNCs. The geographical distance between individuals and technological transmission channels can also weaken social bonds so that knowledge sharing becomes difficult.

Dispersion in MNCs

Distance can be described as the length of the space between two points. However, in international business research, distance is not theorized solely as a physical variable (Klitmøller and Lauring 2016). With the concept of psychic distance (Johanson and Vahlne 1977), distance has also come to be related to subjective orientation and perceptions of business partners, markets and foreign units (Drogendijk and Martín 2015; Nordman and Tolstoy 2014). Hence, technical barriers become linked to psychological and social elements, thus making them sociotechnical.

While some advantages have been mentioned, extant research has also consistently demonstrated that spatial distance affects knowledge sharing in a negative manner. This is not least because physical distance reduces the affinity between individuals, causing a lower degree of interaction and responsiveness (Seers 1989). When there is a considerable amount of physical distance between members, there is a tendency for MNC employees to form subgroups, which may create challenges for interaction and lead to negative consequences for knowledge sharing (Lauring et al. 2017; O'Leary and Mortensen 2010; Polzer et al. 2006).

Hence, the geographical dispersion of the MNC has been described as one of the strongest barriers to knowledge sharing (Leung et al. 2005). In this regard, Haas and Cummings (2015) found that geographical locations and structural differences (sociotechnical factors) of MNCs tended to create just as many barriers to knowledge sharing as person-based differences such as employees' nationality and demographic differences (social factors). Distant geographical locations and structural differences can impede the ability of employees of MNCs to engage in social interaction, which has a significant negative impact on the MNC knowledge flow (Noorderhaven and Harzing 2009). This is because geographical distance combined with a reliance on communication technology has proven to reduce trust (Jarvenpaa and Leidner 1999), increase conflict (Mortensen and Hinds 2001), intensify coordination problems (Cramton 2001), decrease performance (Hinds and Mortensen 2005) and limit extra-role behaviour (Ganesh and Gupta 2010).

Knowledge sharing across distance is not least challenging between Asian and European/American counterparts. Klitmøller and Lauring (2013) studied distance knowledge sharing between Danish and Indian MNC members and found both cultural and linguistic barriers. In a different study by Lauring and Klitmøller (2015) it was demonstrated that the use of electronic media for interaction between Danish parent companies and their Asian subsidiaries increased language-related communication avoidance. In a Malaysian

context, Jain et al. (2015) found trust to be particularly important for distance knowledge sharing behaviour.

The amount of knowledge sharing that employees can engage in, however, is not only influenced by distance but will be further constrained by technology. Technological limitations refer to the restrictions presented by using information and communication technologies rather than face-to-face collaboration. These can be the result of a lack of richness in the media itself, that is, the fact that when using media, you have fewer communicative cues to rely on compared with face-to-face interaction (Daft and Lengel 1987). They can also be due to technological breakdown and discontinuities, for example in the video feed. When technology does not work as it should, for example internet connection problems or disruption of video conference linkage, it becomes one of the key barriers to knowledge sharing across geographical distances (Santos et al. 2012). In an empirical study, Snyder and Lee-Partridge (2013) found that employees preferred communicating face to face, over the phone or by e-mail for knowledge sharing. In another study of firms working on outsourced offshore projects, Solli-Sæther and Karlsen (2014) discovered that face-to-face communication during daily meetings was most effective in inducing knowledge sharing. Thus distance and technology can have a direct impact on social relations and interaction and, in consequence, reduce MNC knowledge sharing.

To generally conclude and according to the literature, knowledge sharing does not happen automatically in any organization, particularly not in linguistically or culturally diverse and geographically dispersed MNCs where technology is essential for inter-unit interaction.

Method

The empirical material presented in this chapter is based on data gathered in two Danish-owned MNCs. We have focused on two types of knowledge sharing that can be affected by social and sociotechnical factors: those that take place *between* organizational units and those *within* units. For inter-unit knowledge sharing, we focused mainly on knowledge sharing between members of Danish headquarters (HQs) and subsidiaries in Asia, including China, the Philippines and India. This region was selected because it presents relatively greater challenges for a Nordic MNC than do, for example, other European countries or the USA. With regard to internal knowledge sharing, we made detailed studies of inter-cultural knowledge sharing in the Saudi subsidiary of MNC 1 and the Danish HQ of MNC 2. MNC 1 is a food production company while MNC 2 is in the pharmaceutical sector.

Data Collection

All interviews took place in the offices of interviewees or in available meeting rooms at the workplace. The interviews were facilitated as a guided dialogue between the researcher and the interviewee. This technique ensured that we received answers to the questions outlined in the interview protocol while simultaneously allowing the interviewee to bring up novel topics related to knowledge sharing. Thus, during the interviews, the participants were asked to identify incidents illustrating situations where social and sociotechnical factors affected knowledge sharing, or where knowledge sharing barriers became linked to MNC diversity and dispersion. To increase the accuracy of their responses, each interviewee was assured anonymity. The interviews were all audio-recorded and transcribed.

In addition to interviews, we included observations on knowledge sharing and the connection to different social and sociotechnical factors at the level of everyday interaction. The researcher undertaking the study was allowed to move around with few restrictions in the two MNC units. During frequent walks around the organizations, he gradually became familiar with a substantial number of the employees at all levels and in many different functions. Observations took place during, for example, business meetings, in the canteen and at social gatherings. In addition to the direct observations, numerous conversations with the employees were scribbled down in a small notebook. All such observations were coded in the same way as the interview transcripts.

Data Analysis

The data was analysed using the steps described by Spradley (1980). The researcher involved in the study of each MNC read through the data, seeking to identify barriers to knowledge sharing and how they related to MNC diversity and dispersion. This involved coding the collected data material and sorting it into different categories. From that, a taxonomy tree could be constructed consisting of specific categories, subcategories and sub-subcategories. This process is subjective because the placement of spoken statements or other pieces of information into categories is not always unequivocal. This is not considered a disadvantage in qualitative studies as long as the responsible individual is aware that results are based on subjective conclusions. An advantage is that the researcher can get a deep understanding of local 'logics' guiding activities in the field. However, a number of measures can be taken to ensure that the researcher is not basing conclusions on twisted or biased information.

Most commonly, methods triangulation (comparing results from different data collection tools, such as participant observation, interviews and documents) and data source triangulation (comparing results from different sources, such as different interviewees and different documents) are applied (Miles and Huberman 1994).

Knowledge Sharing Between Units

For knowledge sharing *between* units, we focused on diversity and dispersion in MNC 1 and MNC 2. With regard to diversity, the two types of heterogeneity that are most prominent for MNCs are cultural and linguistic diversity. Hence, we assess the role of these two types of diversity in relation to inter-unit knowledge sharing. Next, we describe how distance and communication technology can affect MNC inter-unit knowledge sharing.

Culture

Cultural differences were shown to have a great effect on knowledge sharing between members located in different MNC units. In particular, we found that different conceptions of how to share knowledge and different motivations behind seeking and exploiting knowledge sources varied between the Danish HQ employees and their Asian subsidiary counterparts. A prominent theme that distinguished Danes from Indian, Philippine and Chinese employees was the Asians' concern about making mistakes and losing face. As a Danish HQ manager described it: 'They [employees from Asian subsidiaries] do not want to lose face. In the Danish culture, normally we can just say that we have not understood and that would be ok.'

The fear of making mistakes made the Asians reluctant to share or pass on any information unless they were fully confident of the correctness of it. In the eyes of the Danes, fear of losing face had seriously negative consequences for knowledge sharing. As it was described by a Danish employee:

> The Chinese have a tendency to not tell all the bad parts. If there is a problem, they avoid it until it cannot be avoided anymore, instead of dealing with the problem right away. They like push it in front of them—not telling anyone. This leads to a lot of frustration, finger-pointing, and he said, she said. In that sense, it is not a productive way of sharing information. (HQ Manager, Denmark)

Another consequence of the concern with losing face was the focus by the Asian employees on the types of information being transmitted. It was mentioned that Indian, Philippine and Chinese employees would only accept instructions or guidelines if they were very detailed. As mentioned:

> When you give an assignment to a Dane, and the outcome is not clear but is needed some investigation, the Dane will find out how to do it and will try to do the best. A Chinese will ask first thing how do I do that. And then they will answer—I do not have the required information. (Subsidiary employee, China)

A Chinese employee described the differences between knowledge sharing with a Danish manager and with a Chinese manager:

> My boss here in China will give me the directions for the project, and she will follow my advances. While my contact in Denmark will not be so detailed about the project and how this is going. (Subsidiary employee, China)

As the Asian subsidiary members were worried about making mistakes, they would keep sending requests to the Danes for more information on how they wanted the task performed. The Danes, on the other hand, would expect the subsidiary employees to figure out the details themselves as they were the experts in the local field. In addition, the Danes would be frustrated by very long descriptions in e-mails. They preferred very short and direct communication, which the Asian subsidiary employees could feel was intimidating. As a Philippine employee said: 'In Europe, they are very straightforward with their words, and they are very strong. We usually just speak when we are asked.'

From this account, it can be concluded that the cultural differences between employees in the Danish HQs and the various Asian subsidiaries had a negative effect on knowledge. The Asian employees were worried about making mistakes and would therefore ask for many details in a relatively indirect way in order not to reveal weaknesses. The Danes, on the other hand, would be frustrated about the long accounts from the Asians, and they would communicate relatively abruptly with the subsidiary employees. The difficulties in relation to knowledge sharing may be related to cultural differences in knowledge sharing behaviour. However, it was also clear that there was a difference in power between Danish HQ members and local subsidiary employees. In this way, the Danes, having great organizational power, could better afford to be direct in their communication, while employees from the subsidiaries would worry even more about making mistakes.

Language

Another important issue that affects knowledge sharing in MNCs is the diversity of spoken languages and the variability of linguistic ability between the different employees. Here, the Danish managers noticed a great difference when working with Indian subsidiary employees compared with those from China or the Philippines. While the Chinese and Philippine employees would struggle with wording and grammar, especially in verbal communication, it was a different matter for the Indian employees, for whom it was not the English skills that would cause hardship, but the accent. As a Danish HQ manager described it:

> It is not so much that we do not know the same words. It has more to do with the fact that they speak in this funny tone making it hard to understand. If we discuss something complex, we have to ask again and again, and even then we still misunderstand each other. (HQ manager, Denmark)

The Indian employees, however, also found it difficult to speak with employees from Denmark as they felt the Danes did not all have sufficient linguistic skills for sharing knowledge. As one mentioned: 'Danish managers can't even speak English […] so how can we communicate? A lot of the persons we work with in Denmark just don't know English' (Subsidiary employee, India). In this way, language skills have a dampening effect on interaction, thus decreasing the amount of knowledge shared. Furthermore, according to a Danish employee, linguistic proficiency also had an effect on whether or not the knowledge offered was trusted. As one said: 'You look at the ones with language difficulties; they can be really smart but you just don't know'. The fact that these individuals worked at a distance often made the language issues even worse. Verbal communication over the telephone was especially difficult. A Dane described it thus:

> The thing is that the Chinese are not well educated in English. On the phone, you have to repeat everything over and over again. It just delays everything so you just want to stop talking with them and send them an e-mail instead. (Manager, Denmark)

From the above it can be argued that language differences affected knowledge sharing through reduced interaction frequency and reduced trust of the knowledge offered. Hence, the functionality of the language and its link to social group building and trust hindered the ability to share knowledge across

MNC units. Finally, the distance between the subsidiaries made language problems worse as technology had to be applied.

Distance

A significant obstacle to sharing knowledge across MNC units was 'finding each other at the time needed'. This problem was particularly linked to time zone differences. As mentioned:

> With a time zone difference at 7 hours, the window of opportunity for contacting each other is very limited, and don't underestimate this! There is very little overlap in working hours. (HQ manager, Denmark)

It would prove difficult to find the time to communicate when members were located on the other side of the globe. As a Danish HQ employee described it: 'Work time really shrinks as more time zones are crossed, and it is almost non-existing each time we have to include China'. This would delay communication and cause some frustration as the collaboration partner would not be able to proceed with a given task. As one remarked:

> Then they are stuck for an hour or three or eight hours until they get ahold of me, but if they had written on Yammer then another colleague might be able to help them, so that is what we need to get to that they use those channels better. (HQ manager, Denmark)

However, distance did not simply cause issues related to time zone differences. Physical distance also created social distance. This was explained by an employee from an Indian subsidiary:

> In fact if I have a question, I am supposed to call my colleagues of the project at HQ. But instead I ask the one sitting next to me because I know him well, but who is working in a different project. It is easier to ask the one close to you. (Subsidiary employee, India)

This link between the physical and the social distance also made it difficult to have a conversation about more sensitive issues. This was described by a Chinese employee:

> When I was hired, I was promised to work with prototype testing, and I have not done that until now, and that is also because of the distance between my

> manager and me. It is hard to tell him that you want some other job task. I think this is the kind of discussion that you want to do face to face. (Subsidiary employee, China)

It is clear that distance, and in particular time differences, made it difficult to have good dialogue between HQ members and those in the subsidiaries. However, what is equally important is that the physical distance resulting in a need to use technology for interaction is also widening the social gap between individuals in the different units.

Technology

The final issue to focus on in relation to inter-unit MNC knowledge sharing was the technology necessary for communication over distance. Technical problems could often cause severe knowledge sharing problems. As an HQ employee described it: 'When we are facilitating a meeting, the worst thing is when technology messes up. It is frustrating not only for the facilitator but for everybody.' Another conveyed a similar opinion: 'Many participants at web meetings often cause a lot of technical problems. We have to turn off the cameras and microphones to get a better connection making the meeting really bad.'

Hence, technological limitations could make it difficult to share knowledge. As mentioned by a subsidiary manager: 'Often you are not able to have a qualified discussion when you are more than three or five participants attending a virtual meeting.' Using technology for knowledge sharing could also be highly confusing. As one described it:

> Often our virtual communication is just a cascading of information. One of the problems at virtual meetings is that you are pulled in different directions. There is so much going on. It is as if they try to squeeze more into the meeting at the same time … the natural exchange of information is just not happening at our virtual meetings. (HQ employee, Denmark)

It was clearly uncomfortable for employees to share knowledge using information technology. For example, one subsidiary employee from India remarked: 'I think in virtual meetings, some people have this mental block … They are afraid to speak up.' The communication challenges related to technological limitations would also diminish interviewees' desire to engage more deeply with each other. The natural dialogue simply could not take place using technology-mediated communication:

Table 16.1 Barriers to knowledge sharing between MNC units: Danish parent companies and Asian subsidiaries

Diversity	Culture	Worries about losing face: hiding negative aspect of the work process
		Differences in perception of needed details for the required work task
	Language	Differences in verbal expression: strong accent
		Insuficient skills in grammar and vocabulary
Dispersion	Distance	Difficulties in adjusting to working from different time zones
		The development of a social distance based on physical distance
	Technology	Limitations of the technological equipment
		Social disengagement due to technology-mediated knowledge sharing

> You can hear two persons talking about something next to you. Then you sit there and think, that is wrong what they are saying, or, that was interesting, I need to remember that next time and so on, so that is a really good effect. That is practically impossible to get going with someone far away. (Subsidiary employee, China)

Hence, according to our data, technology could have great limitations in terms of facilitating a dialogue between different MNC unit members. Moreover, because interaction became more difficult using technology, this had negative consequences for developing social relations and engaging in social interaction. Findings are summarized in Table 16.1.

Knowledge Sharing Within Units

To illustrate knowledge sharing *within* MNC units, we present two case studies from MNC 1 and MNC 2 depicting social processes that can take place locally. While social and sociotechnical factors were found to affect MNC inter-unit knowledge sharing, this could also be the case within units. We therefore set out to explore knowledge sharing patterns in one subsidiary (MNC 1) and one HQ (MNC 2).

MNC 1: Knowledge Contained

The first case is based on the Saudi subsidiary of a Danish MNC. Expatriating Danish employees to the subsidiary had many different purposes, and knowledge sharing was described as a particularly important part of the relocation.

The inter-cultural knowledge sharing was meant to develop international skills such as language and knowledge of the market and business situation.

In spite of these general formulations about knowledge sharing objectives, the Saudi Arabian subsidiary was mainly perceived as a sales company. The Danish expatriate management was evaluated exclusively on the basis of sales targets and market shares. These evaluation criteria had a significant effect on the daily running of the subsidiary in terms of how internal inter-cultural interaction and knowledge sharing developed.

To simplify management processes, employees in the subsidiary were organized very much in relation to nationality. This meant that all managers were Danish and all supervisors Egyptian. Next in the organizational hierarchy were Philippine employees in the technical positions. Indians and Pakistanis were lowest in the hierarchy, doing manual labour in the production process. As one explained:

> To have an Indian boss for a Saudi worker, that is almost impossible. Same thing with an Egyptian worker and an Indian boss, that is difficult in many cases as well. There exists some sort of informal class division, which divides people hierarchically depending on where they come from. (Subsidiary manager, Denmark)

The hierarchical order was followed by all nationalities, superiors and subordinates, and the segregation somewhat eased the daily communication but, naturally, limited knowledge sharing across national groups. Moreover, suspicions developed between the different nationalities. As conveyed:

> I have tried to be flexible but already after two months, I find that I really distrust some of my co-workers. Also therefore, it is by no means possible to be too soft-hearted. Then you can choose to call it a racist attitude, but what is racism actually? Am I a racist just because I distrust a black? I think there are some concepts about which I have become more flexible since I first arrived. (Subsidiary manager, Denmark)

Similarly, other nationalities also developed negative feelings towards each other and toward the Danish managers. This is illustrated in the following quote:

> I don't like any of the Danish managers. If you ask the assistants, they will tell you they can't stand the managers. People don't like to be in this company but you just try to shut everything out and think of your own problems. You just can't take any more. If managers were like this in India, people would run them

> over with their cars and just bang them up because in India we know how to be humane. We know how to treat people. (Subsidiary employee, India)

Due to such segregation, the marketing department only employed Danes, which gave them a quite limited degree of knowledge of the needs of their customers. Instead, the marketing group would work deliberately based on trial and error. As described:

> What you learn is that if you do like this, you get this reaction from the Arab, but you don't know what happens when the Arab does like this to another Arab. We assume it is the same, but we know very little of what they do together. We have assumptions. We have seen them on the street and on film. But we are not integrated in the society—not at all. (Subsidiary manager, Denmark)

At one point, that approach caused a large financial loss when a commercial movie, featuring a boy and a girl holding hands, did not fit Saudi Arabian taste and was quickly withdrawn.

The way that cultural and linguistic diversity was organized in the Saudi subsidiary structured knowledge sharing so that it would take place mainly within national groups rather than between them. We label this pattern as knowledge being 'contained' by social and sociotechnical factors. This was caused not only by cultural and linguistic differences but also by the organizational structure and the power relations between the different groups, with the Danish HQ employees at the top. As interaction took place in relatively small and socially tight-knit groups working closely together, technology did not affect knowledge sharing. Rather, the close social and physical proximity within the national groups had a positive impact on internal knowledge sharing.

MNC 2: Knowledge Constrained

The HQ of MNC 2 was organized in large, open-space offices of around 40 employees on each floor. A great deal had been done to make employees feel at home and to attract and retain top people, especially foreigners, in order for the company to stay competitive.

The need for internationalization of the HQ arose from a desire to ensure both localized and global perspectives and knowledge resources. The localized knowledge resources were to be understood as various people with different information resources on specific local settings. This could be knowledge of markets in the place where they grew up or in other places they knew well.

Such knowledge could include local legal, cultural or social factors that could influence the marketing of a product. Moreover, the management did not want employees to take decisions too heavily influenced by the working practices in their native countries, but instead to be inspired by internationally developed knowledge. By recruiting people with international skills and letting them work across cultural boundaries, the management tried to rid the organization of ethnocentric viewpoints. Naturally, some material needed to be adjusted to local markets, but the MNC was first and foremost working with global products, and the global perspective was very important in the organization.

Entering the open office landscape, one could see how the employees worked quietly and concentrated at their workstations. No one looked up when people passed and there was no unnecessary talk, no small talk and no private phone calls could be heard. People arrived late and went home early, bringing their laptops with them. One described the office environment:

> This open plan office has resulted in … the humour is definitely gone. I think it is because people are afraid to make a noise. When we had the offices, you could go in and make a joke. It is not entirely gone but it is certainly limited. (HQ manager, North America)

It was clear that time on the job was to be used as efficiently as possible, and jokes would be made about people taking a break or people looking like they did not know exactly what to do. The level of ambition and the focus on getting the job done ensured a good productivity flow, but it created a situation that affected the sharing of ideas in a certain direction. As one argued: 'We simply do not have the time to small talk.' Another outlined a similar view:

> The only problem is that everywhere you go, there are too many things to do. You are bound to your computer and all the activities. It is always deliver, deliver and deliver. There is not much time to communicate. (HQ employee, Romania)

In spite of good opportunities for nonwork activities and offsite meetings, it seemed to be difficult to maintain social engagement in this highly diverse and busy environment. When attempts were made to arrange social events, they always fizzled after the initial excitement. Some employees explained that the many different nationalities automatically created a focus on the professional aspect of organizational life, where a more homogeneous group would focus more on the same interests. People did not talk much about politics or TV shows because they had little common ground.

In connection with the limited informal communication and socialization, the general opinion was that knowledge sharing, also on a more professional level, did not work very well. A lot of work was done twice because the coordination of activities was not in place. At conferences, different teams would make the same presentation, or the material would be filed and stored, and another team would make it once more from scratch. As one put it: 'The wheel is reinvented on a regular basis here.' Another conveyed a similar opinion:

> Sometimes all the departments are using the same agency at the same time, and the agency doesn't really have the time to do a good job. The same with congresses; when we do a congress one year after another, we should have somewhere to keep the material. Otherwise different departments make the same material. (HQ employee, UK)

There were also complaints about local knowledge of different markets never being used in the organization. Most often, questions regarding local markets were answered through known contact persons in subsidiaries or through acquaintances who knew the area. As it was put: 'If I need some information on the United States, I can just go to one of the Americans … but actually, I don't do that very much. Usually I write to someone I know over there.' The one time during the study that the researcher could observe the use of knowledge of overseas markets was when a Chinese employee was asked about the time difference between China and Denmark.

Our material shows that while the HQ had sufficient expertise from many different countries, the special environment that existed created interaction patterns that were not optimal for knowledge sharing. Here, the problem was not conflict or national subgrouping based on culture or language. Instead, diversity created a socially shallow organization where individuals focused almost entirely on their own productivity and felt they had no time for or interest in dialogue aimed at knowledge creation. Hence, the social and sociotechnical circumstances did not block knowledge between different national and language-based groups. Rather, the interaction was very limited. We label this sharing of knowledge as 'constrained' because the flow of information was so limited internally in the HQ. While physical distance was not a problem in this HQ, the social fragmentation created a social distance between individuals. Moreover, the sociotechnical character of the open office that made it difficult to communicate without disturbing others added to the social distance despite employees working in close proximity to one another. Findings are summarized in Table 16.2.

Table 16.2 Barriers to knowledge sharing within MNC units

Knowledge contained	Knowledge is shared only within in-groups Interaction between groups is reduced to a minimum
Knowledge constrained	The social environment is fragmented due to personal differences The general level of knowledge sharing is reduced

Discussion and Conclusion

On the one hand, the diversity and dispersion of MNCs have been considered a potent source of knowledge and innovation (Doz 2006; Ghoshal and Westney 1993), but at the same time social and structural barriers can seriously impede internal knowledge sharing. MNCs by definition are organizations operating in multiple destinations and employing individuals across national and cultural borders. This paradoxical inborn nature of MNCs has meant that it is both a challenge and an opportunity for it to manage knowledge sharing.

Our empirical findings have shown that both social and sociotechnical factors in MNCs can influence the conditions and possibilities for knowledge sharing. In terms of social aspects, culture and language are the two predominant influencing factors for knowledge sharing in MNCs. MNC employees come from different countries with their own national and professional working cultures which have different formal and informal rules about knowledge sharing. The motivations behind seeking and sharing knowledge, as well as the extent and types of knowledge shared, are different across cultures. In some cultures, such as the Chinese culture presented in our case study, crucial information about the failure of certain products can hardly be shared across different languages and cultures. Chinese employees have a tendency not to share negative information even with their own fellow countrymen, despite the ability to communicate with them in their own mother tongue. When they work for an MNC and interact with colleagues from a different culture and language group, it is challenging to achieve knowledge sharing. Our studies point out that employees from different language groups, such as Danish, Philippine and Chinese, struggle to get their messages across due to their mistrust of each other's English skills and their own distinct accents when speaking English. Even after they manage to receive the intended message, that is, the knowledge meant to be shared, they doubt the trustworthiness of the knowledge because of the difficult communication process and the suspicion created during the process.

In terms of sociotechnical aspects, our study found that distance and technology are the two main influencing factors. MNCs have subsidiaries across a wide range of geographical locations and time zones. Both physical distance and difference in time zones create significant challenges for effective knowledge sharing within MNCs. Working in different time zones reduces the actual number of hours during which employees at different units across the globe are able to communicate with each other, and the chance of exchanging and sharing knowledge is naturally reduced accordingly. Not being able to talk to MNC colleagues in the traditional manner, that is, talking to a colleague sitting next to you, has also discouraged employees from initiating more knowledge sharing. Furthermore, distance has made it difficult to discuss sensitive issues which may be critical to some aspects of knowledge sharing. The other factor related to distance is the challenge of having a functional technology that would enable effective communication over the internet. Our study found that technical problems often occur during web meetings, and that they tend to cause an enormous amount of frustration among employees sitting in different offices not knowing when they can continue the meeting. Using this impersonal technology, MNC employees also became less interested in getting to know their colleagues and engaging in more social interaction with each other, which is detrimental to achieving in-depth effective knowledge sharing.

In the case of knowledge sharing within MNC business units, both the social and the sociotechnical factors are still relevant in different senses. Two different social barriers for knowledge sharing have been described in our study: a *containing case* and a *constraining case*. The containing case refers to knowledge being contained within different national groups. Specifically in our case study, only Danish expatriates were in the management group. All supervisors were Egyptian, while Philippine employees occupied all the technical positions. Indians and Pakistanis fell to the bottom of the organizational hierarchy covering manual labour in the production line. Knowledge sharing was not possible across these different national and functional groups due to the different power dynamics between the different groups. The social factors—language and cultural differences—deepened the segregation and made it even more difficult for employees across different groups to engage in social interaction leading to knowledge sharing.

The constrained case refers to a limited flow of information internally at the HQ. Specifically in our case study, despite the fact that the MNC HQ has successfully created a multicultural and multilingual work environment, the emphasis on a professional and aggressive work culture was not helpful in encouraging employees to engage in more social interaction with each other.

While there was little clustering of particular national or linguistic groups, employees at the HQ came from too diverse backgrounds to engage in meaningful social interaction. The only common ground they had with each other was work, where productivity was constantly evaluated informally given the open office layout. Technology and distance factors in this case added a new layer of challenges because of the open office structure as employees could not communicate freely without disturbing each other.

To conclude, both the two social factors and the two sociotechnical factors have created challenges for knowledge sharing between and within MNC units. Despite the fact that they may influence specific knowledge sharing behaviour in different ways across the cases we presented here, in general, social factors such as language and cultural differences make it difficult to achieve knowledge sharing because only weak social ties could be created across groups. Hence, less social interaction and less socialization take place due to the linguistic discouragement and cultural differences (Biswanath Dutta et al. 2015; Gross and Kluge 2014; Nielsen et al. 2011). Our empirical findings also confirmed that geographical dispersion of the MNC is one of the strongest barriers to knowledge sharing (Leung et al. 2005). All these barriers coexist with the global structure of MNCs. Indeed, technology, geographical richness, language and cultural diversity are the sources and foundations of rich knowledge sharing. However, MNCs cannot achieve knowledge sharing automatically, precisely because of these social and sociotechnical factors.

Practical Implications

Our study has several important practical implications for MNCs striving to achieve better knowledge sharing within and across different units. First, with reduced trust across different language-based and cultural groups among MNC employees, it is crucial for MNCs to purposefully nurture trust among employees. By developing shared goals and forming more social relationships, trust can be developed among MNC workers speaking different languages and having different cultural backgrounds (Chen et al. 2014). Second, with frustration and discouragement with communication being created by the lack of smoothness in technology-facilitated interactions, constant improvement of technological facilities and workshops aiming at enhancing employees' IT familiarity and skills are essential for overcoming the sociotechnical challenges to knowledge sharing in MNCs. Third, improving the awareness of knowledge sharing has been found to be influential in MNC employees' actual knowledge sharing behaviour (Ekore 2014). Our study has also pointed

out that knowledge sharing is not an automatic or required behaviour, and MNCs tend to become discouraged easily. With such an intangible and unmeasurable behaviour, MNCs can only provide more training and support to improve the awareness of sharing knowledge, and hope that more employees will actually engage in it.

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Part III

Knowledge Management in Practice

17

Enhancing Knowledge Management (KM) in the Fourth Industrial Revolution Era: The Role of Human Resource Systems

Troy Sarina

Technological innovations are having an unprecedented effect on the way we live and work and how organisations function in modern economies. The 'Fourth Industrial Revolution' has been facilitated by the emergence of new technologies that have sped up the production, distribution and consumption of goods and services around the globe while also displacing the role of labour within the production process (Schwab 2017). In this era, the role that knowledge plays in allowing individuals and organisations to respond to these changes is increasing. This chapter revisits our understanding of what knowledge actually entails and identifies how organisations can leverage human resource management (HRM) systems to identify, utilise and retain the repositories of knowledge that organisations rely on to secure a competitive advantage.

This chapter argues that at the heart of knowledge management lies an inherent tension between organisations' increasing need to use HRM to access tacit knowledge held by individual workers, and individuals' need to retain an exclusive pool of knowledge that can safeguard their employment, indeed their livelihood, in the increasingly precarious labour markets emerging in modern economies. Applying principles associated with communities of practice (CoPs), this chapter concludes that the strategic use of human resource (HR) systems can play an important role not only in overcoming these challenges, but also in helping to enhance the transfer and utilisation of information found in the knowledge repositories residing within modern organisations.

T. Sarina (✉)
Department of Marketing and Management, Macquarie University, Sydney, NSW, Australia

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Defining Knowledge Management (KM)

An all-inclusive definition of knowledge management (KM) remains difficult to establish due to the diversity of views and range of concepts that this term entails. The continued debate surrounding KM is partly due to a growing awareness that understanding the dynamics of knowledge creation and management remains a complex task. For the purposes of this chapter, KM is seen as the process of managing knowledge in an organisation to create a distinct source of competitive advantage through the formation of new assets, capabilities of processes which contribute to organisational success (Ferraresi et al. 2012; Tiwana 2002). Ideally, the process is carried out by workers who have diverse backgrounds and experiences which help generate personal 'silos' of knowledge. This knowledge is then captured and synthesised by organisational information systems, thereby allowing this information to be used by others to generate new outputs (Burstein et al. 2010: 78). For this process to be successful, KM involves the exchange and management of *tacit, explicit* and *implicit* knowledge residing within an organisation (Burstein et al. 2003) (see Fig. 17.1). As this chapter shows, leveraging these sources of knowledge is no easy task due to the impact of factors including the broader national

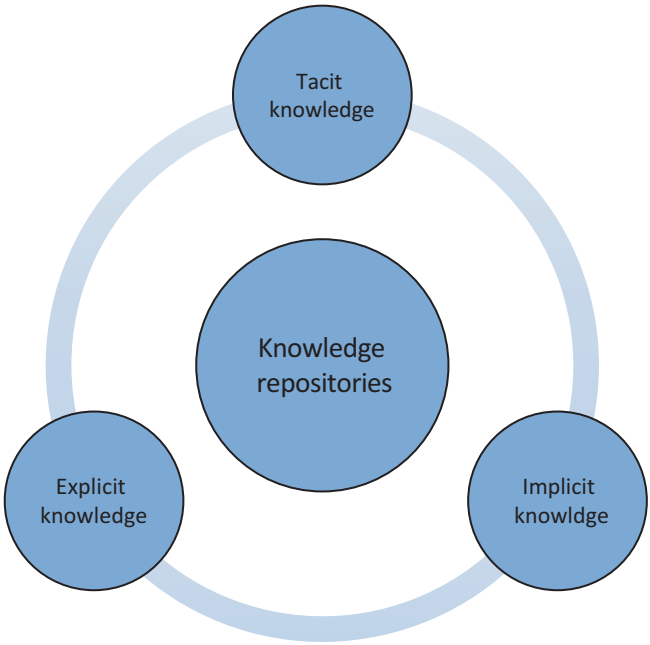

Fig. 17.1 Sources of knowledge in organisations

contexts in which organisations operate, the structures used to order work and knowledge transference, and the unwritten rules that bind groups of workers together and determine their approach to knowledge sharing (Zheng et al. 2010). However, if an organisation is able to coordinate these types of variables effectively, it can not only improve performance and develop new innovations but it can also enhance worker knowledge and diffuse information throughout the organisation (Akbari and Ghaffari 2017).

Why Do Organisations Need to Be Concerned with Managing Knowledge Effectively?

The external environments in which organisations operate are becoming ever more competitive. Increased levels of global trade, deregulated financial markets and the onset of fast-paced technological change have all combined to create hyper-competitive environments. Writers such as D'Aveni (2010) have identified these hyper-competitive environments as having a number of characteristics. Firstly, the life cycle of products being produced by organisations is shortening. One only has to reflect on the evolution of the smartphone to become aware of how rapidly innovation occurs today. It has become the custom and practice for large technological manufacturers to release new mobile phones every 12 months, with mid-life cycle updates occurring every six months in order to take advantage of new technologies as well as to differentiate products in the marketplace. This is in stark contrast to the speed of innovation and change experienced in many sectors a little over two decades ago. In some cases, it was not unheard of for car manufacturers to produce the same model of motor vehicle for over 20 years (Pettigrew and Whipp 1993). Today, this slow pace of innovation would almost certainly lead to organisations not being able to compete within markets.

This type of technological innovation has had a profound impact on the ability of organisations to 'draw down' from the knowledge and skills that reside within an organisation and its members. As technology radically alters how work is undertaken, the value that organisations can realise from current resources and capabilities is diminished (D'Aveni 2010). Consumer preferences have also changed radically over the last few decades as demographic shifts have given rise to millennials, or individuals aged between 15 and 30, who demand the latest products which incorporate technological innovations. For example, in the United States, this group is projected to account for almost one-third of all retail spending in the US economy by 2020, and simi-

lar trends are expected in other developed economies (MacKenzie et al. 2013). As a result, successful organisations will be those that are able to develop 'dynamic capabilities' which allow organisations to respond to, take advantage of and even predict future changes that an organisation is likely to encounter in these highly competitive and technologically determined environments. To do this, organisations need to leverage the human resource function to nurture systems of innovation and learning that allow workers to connect across 'time, networks, and institutional frameworks' (Shipton et al. 2016: 4).

The Evolution of Knowledge Management as a Strategic Resource: The Threats from the New 'Gig' Economy Work

The 'dynamic capabilities' identified by D'Aveni result when human capital and HR systems (including KM) are able to be leveraged quickly to respond to changes in competitive pressures, thereby giving the organisation a competitive advantage. Perceiving human capital (and the knowledge workers possess) as a source of competitive advantage was originally identified by Penrose (1959), who developed the pioneering resource-based view (RBV) of the firm model which would go on to spawn a large field of scholarship (see, for example, Barney 1991; Grant 1996; Peteraf 1993). The RBV model identified that organisational resources are more than the bricks and mortar that are used to house production and an organisation's workforce. Instead, organisations are comprised of both intangible and tangible resources that have some type of connection to them and which can be leveraged through strategy to provide a distinct advantage over competitors. This is particularly important for capital-intensive industries such as aviation, where the main source of differentiation between competitors is found in the way labour is organised so that skills and knowledge are used to differentiate the services offered (Bamber et al. 2013). Today, increased competition between organisations in the marketplace has led to a recognition that even leveraging these types of dynamic capabilities may not be enough. Organisations need to not only develop new capabilities but also to ensure that the capability or innovation itself is impossible for competitors to replicate if it hopes to retain its market position (O'Reilly and Pfeffer 2000).

Models of organisational competencies, such as the one developed by D'Aveni, are premised on the assumption that organisations are able to learn and refine the way they operate which then leads to performance being

enhanced. This is where the HR function has played an important role in promoting a 'learning organisation'. This is defined as an organisation which has the skills to be creative, acquire and disseminate knowledge, and share insights that have been discovered through new learnings or a systematic review of prior production (Garvin 1993; Serrat 2017). The types of new knowledge and learnings that are created assist in refining the (dynamic) capabilities to sustain organisational success (Wick and Leon 1995). The catalysts for creating such learning organisations continue to be a source of much debate. However, there is growing consensus that there are certain organisational 'enablers' which, at least in theory, have a positive correlation with the creation of organisations that seem to 'learn'. These include communication systems that allow individual workers to participate in and inform policy-making decisions within an organisational context (for example consultation committees). Structuring work so that it empowers individuals to make decisions and ensuring they have the ability to take risks in experimenting with how work is designed, carried out and evaluated have also been found to be important. Delegation of authority via empowerment also requires that organisational boundaries are redefined. In particular, learning organisations are those that eliminate narrow spans of job control and instead promote new matrix-based structures that draw together workers with different skills. The provision of such enablers allows an organisation to extract value from human capital. The combined effect of these enablers has also been found to be the creation of an organisational culture that recognises and celebrates the benefits that this approach to work design has on the creation of new knowledge and the dissemination of that knowledge across entire work groups (Newman and Newman 2015).

Despite the benefits associated with learning organisations, it is important to be aware of how internal labour markets have evolved since the conception of the RBV model and how this may impact on the capacity for organisations to organise and benefit from knowledge creation. In viewing labour as a source of competitive advantage, the RBV model is premised on an assumption that work and production are mediated through organisations. Organisations are able to access the benefits of human capital as labour is contracted to them by the establishment of an employment relationship that recognises the interdependence that exists between these two parties. However, the world of work has fundamentally changed. Work is now synonymous with precarious working arrangements comprised of increasing part-time and casual work as well as the creation of supply chain and contracting arrangements that are used to narrow the core competencies of an organisation (Pollert 1988). This fracturing of working arrangements has created a greater level of divergence in the

way that organisations value particular work groups as well as the way in which they attempt to access and manage valuable know-how. Writers such as Lepak et al. (2017) and Lepak and Snell (2007) have investigated how multiple HR systems are now deployed within a single organisation, thereby limiting the diffusion of new ideas and knowledge as well as redefining the HR architecture of modern organisations. As this process of fragmentation occurs, organisations are confronted by the ongoing challenge of generating new knowledge and innovation from what seems to be an ever-declining core workforce, thereby impairing an organisation's capacity to combat future competitive threats as well as being able to take advantage of market opportunities brought about by intensifying competition.

Building on the challenges brought about by fragmenting work practices, the supposed 'Fourth Industrial Revolution' taking place now will further complicate the ability of the HR function within organisations to deliver a source of competitive advantage through creating and managing the knowledge derived from human capital. This could lead to a significant decline in the role that KM plays in the success of organisations in the future. A number of factors can be used to explain why the competitive advantage flowing from KM may be under threat. Firstly, technology itself is forecast to have a profound impact on or even to replace up to 70% of existing occupations, leading to greater automation in production processes and thereby minimising the advantage that can be derived from human capital (PWC 2015: 10). Secondly, the way in which work is carried out is fundamentally changing. Organisations are losing their integral role in how work and competition occur. One of the fastest-growing sectors of developed economies is the 'gig' economy sector. In Australia, over 32% of the workforce has undertaken some type of gig work since 2014 and this figure is predicted to continue to increase over the next five years (Cheung 2015). The term 'gig' is associated with the music industry, where bands or performers would be paid for a single performance with no expectation of future work and where no ongoing legal obligations would exist between the workers and those that engaged them (Friedman 2014). Digital platforms such as Uber and Airtasker now facilitate the exchange of labour between those who demand that a task or 'gig' be completed (the customer) and those who provide the service or skill required to complete the task (the gig worker) while taking a proportion of the fee associated with this exchange. Under these increasingly popular forms of contractual arrangements, the innovator or owner of the digital platform is not concerned with accessing the knowledge of these gig workers in order to enhance the competitiveness of these digital platforms. Instead, the types of skills and knowledge held by individual workers are simply used to determine the appropriate exchange price to

be facilitated by these online platforms between the end-user and the gig worker. As a result, the role that traditional organisations have in facilitating production within society is beginning to evolve. Indeed, the 'entrepreneurial worker' who can contract with multiple digital platforms to carry out various forms of work is likely to be more focused on retaining their own knowledge, rather than sharing it with organisations, in order to protect their advantage over an ever-increasing number of individuals who are becoming reliant on this highly competitive form of work.

The somewhat bleak predictions of changing labour markets outlined above highlight the risks that organisations could face if they don't future-proof themselves against these macro-changes occurring within labour markets by emphasising the role that new knowledge plays in organisational survival. Organisations still have the ability to make strategic choices to either pursue a 'high-road' (investment in human capital) or 'low-road' (cost minimisation and reduction in employment) strategy when it comes to pursuing organisational objectives (Kochan 2006). For those organisations that remain committed to engaging labour in order to secure a competitive advantage over their competitors, the primary question that needs to be addressed is: Where do the repositories of knowledge rest within an organisation that can deliver a competitive advantage? Here the RBV model still remains an invaluable tool. Adams and Lamont (2003) build on this work to identify a number of constructs that can be derived from this model. In particular, they argue that a capital-based view of the firm allows organisations to identify how performance can be enhanced by the financial, physical and human capital which resides within an organisation. Focusing on the labour aspect of this construct, human capital can be seen as the culmination of the 'training, experience, judgement, intelligence and insights' of workers within those organisations (Adams and Lamont 2003: 146). However, an organisation's capacity to access and store this knowledge remains problematic for several reasons.

Understanding Sources of Knowledge Within Organisations

Tacit Knowledge

Firstly, consideration needs to be given to the type of knowledge that workers possess. In one sense the knowledge held by a worker continually evolves and is experiential in nature. It develops from a combination of their own past

experiences and inherent skill, their completion of tasks assigned to them, their undertaking training and development, and the general ability that workers have to observe and develop a greater understanding of how work is done by sharing information with each other. In one sense the outcome derived from these types of activities is the generation of 'new knowledge' or know-how that is rare and distinct, thereby providing an organisation with a possible source of competitive advantage (Bogner and Bansal 2007). However, it remains a challenge to capture these new learnings and knowledge, as this information is 'tacit' in nature. That is, the knowledge is uncodified and is retained by the individual and those with whom he/she chooses to share the information. Dissemination of this information occurs via informal means or discussions between work groups, which are determined by social norms shaped by workers themselves rather than by organisational policies and procedures. This leads to tacit knowledge being created in an incredibly dynamic and unique way. Indeed, the creation of tacit knowledge is something that has been 'embedded in the collective experience of a particular work group or occupation' rather than the result of management interference (McKinlay 2006: 243). Tacit knowledge remains at the 'edges' of procedures and systems that attempt to regulate how work is carried out within organisations. Consequently, management has historically had great difficulty monitoring, let alone controlling, the way in which this tacit knowledge is developed and applied by workers in an organisational context (Newell et al. 2001). Despite this challenge, organisations can derive strategic value from various work groups if an organisation is able to leverage their uniqueness, which is primarily found in the tacit knowledge they possess (Boon et al. 2017).

The challenges associated with capturing tacit knowledge are only likely to grow as organisations and economies continue to evolve and the number of workers engaged by organisations to carry out work via the traditional employment relationship form is further scaled back. For individual workers who remain as traditional 'employees' within an organisation, the value that this tacit knowledge has for them is only likely to increase as the informal, uncodified knowledge that they possess will become a critical source of competitive advantage which they can use for career progression. One only needs to look at the composition of Australia's economy to identify that currently over 72.5% of Australia's labour market works within the services or intangibles sector (ABS stat: 6306), where innovation through the generation of new knowledge is crucial to remain competitive.

The individual worker's incentive to share this tacit knowledge within an organisation is constrained by an inherent flaw that lies at the heart of the concept of KM. This conceptual frame assumes that the acquisition and

diffusion of new tacit knowledge held by individuals is beneficial as it helps to democratise the process of learning and enhances the overall proficiency of a workforce. However, in reality, the relinquishing of tacit knowledge by the individual worker can lead to a loss of work autonomy and limit their capacity to advance their own career due to the assessment criteria that are commonly used in contemporary performance appraisal systems. Individual career progression is now more closely dependent on individuals being able to identify their distinct contribution to overall organisational performance. As a result, individuals are becoming increasingly reluctant to share their knowledge. This leads to ongoing difficulty in aligning the interests of the individual worker and that of the organisation when it comes to who should be the custodians of knowledge (Hull 2000: 156). As new knowledge is unlikely to be shared, there is a greater risk of jeopardising the ability of an organisation to develop a deep specialisation or understanding of what it does, which can lead to a more superficial understanding of new learnings, thereby reducing the areas of competitive advantage and distinctiveness that the organisation may have (McKinlay 2006).

The Effectiveness of Explicit Knowledge Systems in Generating Innovation and Competitiveness

In contrast to tacit knowledge, there are the codified or what are commonly known as 'hard' systems of knowledge storage that the HR function in an organisation can use to capture and utilise information in order to respond to changes in external markets. Returning to the conceptual model of Adams and Lamont (2003), these systems can be classified as organisational learning-based resources. These are comprised of both the internal and external mechanisms that can be utilised to enhance learning and the way decisions are made within the organisation (Adams and Lamont 2003: 145). Such mechanisms can include external scanning, benchmarking, firm-wide databases that can be used to capture worker experiences and the introduction of new organisational structures that promote cross-functional teams which require workers to share information in order to continually improve and learn how to create a more sustainable organisation (see, for example, Drew 1997; Edmondson and Harvey 2017; Hambrick 1981). It is beyond the scope of this chapter to systematically review all of these systems in detail. Instead, what will be considered here is how effective these knowledge systems are in capturing, retrieving and utilising the experience of workers to enhance organisation performance.

It should come as no surprise that the value of these knowledge systems remains a fiercely contested issue. There is considerable scholarship (see, for example, McDermott 1999; McKinlay 2006; Scarbrough 2002; Tsai 2002) showing that these types of codified systems have struggled to contribute to the generation, retention and dissemination of knowledge for a number of crucial reasons. Firstly, a predominant theme in the literature is that the creation of sophisticated, detailed online systems geared towards enticing workers to input their knowledge are simply too difficult to navigate while also requiring a great deal of work time to operate effectively (Ardichvili et al. 2003). As a result, these systems lead to workers feeling frustrated and less likely to log on to input any valuable information or unique insights that they may have. Furthermore, some workers have reported feeling that their information is not sufficiently valid or worthy to enter into these systems (Ardichvili et al. 2003). This has deterred workers from participating in the process of storing the new information they have acquired from undertaking their assigned tasks. In circumstances where organisations have established these systems, the sheer volume of material stored on these devices has made it difficult to extract relevant and useful data when required. This has resulted in these codified repositories resembling 'information junkyards' rather than dynamic systems of information that can be utilised to enhance organisational performance (McKinlay 2006: 248). In order for these explicit knowledge systems to be more effective, the focus needs to be on the ability to share and, at the same time, protect sensitive technical data (Manhart and Thalmann 2015).

A further constraint on the effectiveness of these codified systems stems from the assumption that the information they capture is a public good. As identified above, individual workers who find themselves in highly competitive environments have been found to 'information hoard' rather than share their knowledge, as this is a 'private asset' that is becoming an increasingly important source of competitive advantage for the individual worker to ensure their own progression and organisational survival (Wasko and Faraj 2000). Finally, the ability of these systems to work effectively and equitably is constrained by the political nature of organisations. Individuals will always have a tendency pursue their own self-interest, and by divulging privileged information across an entire organisation, an individual's power or access to resources could be adversely effected. The 'assumed neutrality' underpinning these codified systems often results in unintended consequences affecting the political and cultural landscape of an organisation, encouraging individuals to retain rather than disseminate knowledge (Neely and Bourne 2000).

However, despite these criticisms, the HR function within the firm can attempt to enhance the effectiveness of these systems in a number of ways. Firstly, HR can revisit the architecture of organisational structure to reflect on how explicit knowledge systems function. Organisational structure has long been recognised as determining who carries out certain functions in an organisation (Daft 2006). Structure also determines the concentration of decision making within an organisation. In order for new knowledge to not only be created but also disseminated, a decentralised structure has been found to be more effective in encouraging communication among workers within organisations. In particular, it allows more information to flow laterally as well as virtually, thereby providing more opportunity for experts to participate in decisions by sharing their views as well as mobilising information more effectively to respond to changes in external environments (Schminke et al. 2000). As a result, management's capacity to establish or alter organisational structures can determine the location and accessibility of explicit knowledge systems that workers experience.

Another aspect of organisational design that has been found to enhance the effectiveness of explicit knowledge systems in organisations is the presence of a designated KM champion. The appointment of these champions is seen as a deliberate strategy to implement an organisational design that facilitates and assists in the transference of new knowledge throughout an organisation. KM leaders aid in establishing appropriate organisational systems geared towards securing knowledge that is crucial to organisational success (Burstein et al. (2010)). Effective KM champions have been found to have a number of key traits, including: comprehensive knowledge of organisational infrastructures and of the methods of communication used to transfer knowledge between individuals; the capacity to implement reward systems for sharing information that progress individuals' careers; and the ability to secure a better understanding of where tacit knowledge lies within the organisation (Desouza and Awazu 2005). The knowledge contained within such a role can in itself act as a source of competitive advantage. Although the reported uptake of establishing formal KM champions has been somewhat limited (see Burstein et al. (2010)), the provision of such roles within an organisational structure has nevertheless been an important element of the learning-based resources construct deployed by some organisations to utilise knowledge residing within organisations. Indeed, the appointment of a Knowledge Officer (KO) as a deliberate part of an HR strategy has played an important role in improving the ways in which new knowledge is acquired, created, shared and utilised (Hussinki et al. 2017).

If used effectively, the expert knowledge associated with KM champions can help address some of the criticisms levelled at the formal knowledge systems outlined above. For example, McKinlay (2006) argues that explicit or 'hard' KM systems do provide organisations with an advantage when they are used to capture 'outward-facing, largely client based information' as these systems are focused on how an organisation operates, rather than attempting to capture information about how workers complete their tasks (McKinlay 2006: 249). Other recent studies support this proposition, finding that open innovation (OI) systems, which are technical online banks of information, can be used effectively by an organisation to capture material provided by external entities that share their know-how as part of a strategic partnership or joint venture with an organisation (Martinez-Conesa et al. 2017). In conclusion, the capacity for explicit knowledge systems to foster new innovations seems limited. At best, research has found that these formal systems of managing knowledge have been most effective in collating data external to the organisation as well as codifying work where tasks are relatively unambiguous and there is an absence of alternative ways of completing tasks (Davenport and Glaser 2002). Given the limited effectiveness of such systems, redirecting the focus towards acquiring a greater understanding of how knowledge is generated within an organisation, rather than attempting to control it, is likely to deliver greater long-term benefits to organisations who need to nurture knowledge generation in order to remain competitive in their environment. Given that tacit knowledge has been identified as a valuable type of knowledge, yet is difficult to capture through formal KM systems within an organisation, our attention needs to turn to the third major source of knowledge that can be found in organisations today: *implicit* forms of knowledge storage.

Implicit Knowledge and the Challenges in Creating It

Implicit knowledge refers to information or know-how that has been successfully converted from tacit knowledge held by workers within an organisation (Frappaolo 2008). To understand how implicit knowledge is generated, consideration needs to be given to the macro-factors that influence the interplay between tacit and explicit KM systems within organisations. Background knowledge about organisations comprises history, external and internal culture, and the interaction patterns that regulate how workers engage with each other (Moustaghfir and Schiuma 2013). One of the most important elements

of this background knowledge for understanding why organisations adopt a particular approach to KM is the broader cultural context surrounding an organisation. In undertaking a multinational study, Efrat (2014) investigated the role that aspects of national culture play in converting knowledge into the know-how required for innovation to occur.

Adopting the cultural frame of Geert Hofstede (1994), Efrat proposes that a number of cultural dimensions, including power distance (PDI), masculinity (MAS), individualism (IDV) and uncertainty avoidance (UAI), are likely to shape the type of implicit knowledge organisations are able to capture. It is worth exploring some of these cultural dimensions in more detail here. PDI is used to measure the extent to which members of society accept or challenge inequality. In high PDI contexts, organisations are likely to use more explicit forms of KM systems due to the presence of highly formal and hierarchical structures in which management retains a high level of decision-making power over how production occurs. As a result, organisations located in high PDI contexts were presumed to deliver lower levels of new knowledge and innovation, as these hierarchical structures encouraged the use of formal KM systems which have been found to be problematic in capturing and utilising new information or know-how. In contrast, organisations in low PDI contexts were characterised by flatter organisational structures where decision making is shared more equally among workers resulting in higher levels of tacit knowledge, and it was presumed that this would lead to a higher level of innovation being found in organisations in low PDI contexts. However, the findings from this study were mixed. Initially the proposition that PDI would have a direct influence on a firm's capacity to generate new knowledge was found to be valid. Yet over time the impact the PDI seemed to have on the creation of know-how that led to innovation was 'neutralised' by the level of investment allocated to research and development functions within an organisation regardless of its PDI rating (Efrat 2014: 17). It would seem that the generation of implicit knowledge was not necessarily contingent on the cultural context in which an organisation operated, but rather on the allocation of financial resources that encouraged individuals to share their knowledge.

The impact of other cultural aspects such as individualism on how workers generated knowledge also delivered surprising results. IDV is used to examine the extent to which culture encourages the privileging of an individual's interests over the interests of a collective or group. Relating this to the unwritten approach taken to KM in organisations, it was presumed that organisations located in high IDV countries would display high levels of innovation, as high IDV cultures have a distinct entrepreneurial orientation which motivates individuals to produce new

knowledge and ideas. However, this particular study did not find that IDV played a role in delivering innovation. Instead, organisations located in highly collectivist countries were found to produce greater levels of innovation due to the capture of information in formal KM systems (Efrat 2014: 17). There are a number of explanations for this. Firstly, globalisation has radically altered the way in which organisations operate. Organisations can no longer respond to market pressures by retaining distinctly siloed, hierarchical structures. Rather, organisations are more commonly comprised of networks spread across the globe, where each satellite or nodule of the structure has a specific function to fulfil in the manufacturing of a new product or provision of service. These network structures facilitate greater collaboration and sharing of information in order to generate new knowledge and innovation, thereby reducing the emphasis placed on individual contributions to new knowledge (Ritter and Gemunden 2004). As workers share more information across national and structural boundaries, there is a greater chance of being able to capture the information which is being shared electronically via the use of explicit KM systems.

These types of studies seem to suggest that the effect of different cultural backgrounds on the way implicit knowledge is created in organisations is being reduced as the pace of globalisation accelerates. Such outcomes reinforce the importance of HR design in appointing KM officers who can plan and modify organisational structures and communication systems to ensure greater collaboration and the capturing of tacit knowledge that is shared across the network structures formed in organisations. In other words, KM officers can help develop 'relation routines', that is, design job roles and organisational structures that help workers get to know each other so they can establish informal processes and norms that govern how information is shared among them (Fu 2015). Although these types of macro-cultural analyses are useful for providing insights into the impact that cultural variations may have on the generation of new knowledge, they don't address the internal, unwritten norms that operate in an organisation which help to explain *why* individual workers may agree to share or retain their knowledge. HRM literature often casts human capital as a tangible resource that organisations can leverage due to labour's capacity to perform work as well as organisations' ability to tap into a worker's skill and knowledge through effective HR design. Indeed, that is the main motivation behind establishing KM systems as part of a broad HR strategy. However, a crucial explanation for why the effectiveness of KM systems remains limited is that although explicit systems attempt to govern how knowledge is captured, they are unable to control *how* and *why* workers share knowledge. Instead, the unwritten and hidden social structures and norms found in an organisation play a major role in knowledge transfer. Commonly known as 'social capital', these informal norms play an integral

part in determining the interplay between tacit, explicit and implicit forms of knowledge within an organisation.

In theory, HR systems and processes can be used to influence how social capital is formed and how it operates in an organisation. HR can design and implement work systems that create enabling work environments which encourage the sharing of information and knowledge, generate greater trust between workers and management, and deliver greater technical skill acquisition due to the development of intra-firm networks that recognise the importance of knowledge sharing (Boxall and Purcell 2011). In this sense, social capital is seen as an additional resource that can enhance production and the utility derived from knowledge shared among the labour force (Schiff 1992). However, merging the social capital that is independently formed in work groups with manufactured HR systems can be a tricky path to navigate.

Bridging the Gap Between Tacit and Explicit Knowledge: Communities of Practice?

In order for the HR function to be able to better link social capital with explicit HR systems and take advantage of new learnings, we need to develop a better understanding of how and why social capital is created among workers and the role this has in creating tacit knowledge. Wenger and Snyder (2000) argue that in an era of the 'knowledge worker' the sociological concept of communities of practice (CoPs) may provide insights into the informal systems that facilitate tacit knowledge and how HR may be able to leverage them to overcome the current weaknesses of explicit KM systems. A CoP can be defined as a 'group of people informally bound together by shared expertise and passion for a joint enterprise' (Wenger and Snyder 2000: 139). These informal arrangements are governed by a set of informal rules that are determined by them rather than by management. In one sense, the concept of work being something that is executed by groups of workers bound together by a common purpose and utilising closely guarded and refined knowledge is not a new idea. A CoP may in fact be nothing 'but a pale shadow of the rich cultural milieu and robust autonomy of the craft tradition' (McKinlay 2006: 252). However, despite this devolution away from the closely guarded worker guilds of the past, viewing work through this conceptual lens can help develop a better understanding of how social capital in a CoP leads to tacit knowledge creation and why contemporary HR systems struggle to convert such knowledge into innovations that create a competitive advantage.

Firstly, the purpose of a CoP is fundamentally different from the traditional organisational structures found in modern organisations. A CoP is concerned

with building upon the existing knowledge base that such communities possess so that the skills of its members can be refined. In one sense, there is a deliberate and often long-term commitment to refine personal skills. This is in contrast to the creation of formal work teams in organisations, where the primary purpose of such organisational constructs is to produce a specific service or product for an end-user. A CoP can assist in enhancing the capability of individual members through knowledge sharing that helps create solutions to problems that the members of the CoP face as a group (Jimenez-Zarco et al. 2015). The construction of such reciprocal social norms regarding the use of knowledge within the CoP allows workers to retain this knowledge regardless of whether they work within or outside a particular organisation. In effect, these knowledge repositories transcend organisations, as knowledge is retained by members rather than in codified systems that might reside within one organisation.

Membership also remains a distinguishing feature of a CoP. Unlike traditional management systems which allocate individuals to departments or functions based on skill sets, membership of a CoP is determined by the workers themselves. Again, this facilitates the establishment of independent agendas as well as enhanced autonomy, where the group is able to select its leadership but more importantly allow individuals themselves to determine whether they participate in such a collective or not. Currently, an important function in which HR is involved is the design of organisational structures which create more autonomous work systems in an attempt to encourage workers to share their tacit information. As a result, management is able to mandate how work is done and in doing so pressure workers to share information which they may see as valuable for their own mobility within and outside the organisation. This is in stark contrast to a CoP, where individuals retain the right to share or withhold the tacit information they possess. By participating in such communities, workers demonstrate a commitment to deep and worthwhile learning that meets their own intrinsic motivations to learn and impart knowledge rather than address broad organisational objectives.

A CoP can also be distinguished from traditional organisational structures by how working arrangements and knowledge sharing are negotiated by the individual and the organisation. Traditional structures rely on codified systems of knowledge to develop a clear sense of identity or purpose. For example, the typical job descriptions used to 'encode' what functions a worker should carry out within an organisation help to establish what work should be done and how. Even organisational objectives or goals provided by managerial edict help to establish the expected level of reciprocity and effort to be displayed by workers when it comes to carrying out tasks and sharing knowledge (Wenger and Snyder 2000). However, the concept of social capital found in a

CoP is fundamentally different. Instead, a CoP relies on the intrinsic passion, commitment and expertise of each individual to develop a common purpose to enhance the collective tacit knowledge held by the group. The construction of such 'common languages' between members has been found to play a major role in determining the level of information sharing that occurs between individuals in person as well as through social networking sites (SNS). Indeed, the level of socialisation that occurs within work groups has a positive correlation with the level of productivity that these groups produce (Khodaee et al. 2016). In particular, important factors that have been found to form the basis of these unwritten customs include the presence of a common language that allows individuals to share jargon-specific information as well as the awareness of an accepted collective goal that a group holds. Most importantly, other unwritten social norms understood by members of the group dictate how knowledge is shared and created. These include the level of trust, norms of interaction, perceived friendship and process of allocating rewards and punishments. Combined, these factors help determine how knowledge is shared within these communities (Magnier-Watanabe et al. 2010).

The Role of HR in Securing Benefit from Knowledge Repositories Within an Organisation

This chapter has shown that the process of managing knowledge in organisations remains a complex task. The crucial source of information for creating new innovations and ideas remains tacit knowledge. However, as discussed above, the success of traditional management approaches in capturing know-how retained by individuals via explicit or codified information systems has been patchy at best, for two important reasons. Firstly, the social capital comprised of the unwritten rules that govern the sharing of knowledge that exists between workers often remains beyond the scope of management or HR to control. Secondly, the changing nature of organisations has meant that workers are becoming less willing to share privileged information due to the risk of jeopardising their own career aspirations. As a result, the conversion of tacit knowledge into implicit knowledge or know-how through the use of explicit HR systems remains problematic.

In response, this chapter suggests that the HR function can enhance the process of knowledge generation by constructing appropriate organisational architecture. The promotion of CoPs may help to resolve the inevitable tussle between workers and management over who benefits from new knowledge

creation and better coordinate the interaction between tacit, explicit and implicit sources of knowledge within an organisation. Instead of relying on explicit KM systems to simply 'extract' tacit knowledge from workers, HR needs to develop enabling structures and systems that encourage CoPs to flourish. This can be facilitated by the appointment of KM champions who have the relevant competencies to understand the role that a CoP may play within an organisation without necessarily controlling how it functions. Wenger and Snyder (2000) describe how the petroleum company Shell encourages individuals to work with a KM consultant within the organisation to identify not only new members but also locations where a CoP may help to address current deficiencies in learnings and understandings within an organisation. In doing so they are able to assist, rather than control, the formation of social capital governing these communities, as well as signal organisational enthusiasm, which is crucial during this 'embryonic' phase of CoP development (Wenger and Snyder 2000: 144).

The HR function also needs to foster and build a CoP by implementing appropriate organisational design systems and providing financial support to ensure that knowledge sharing is promoted within these communities. For example, HR can develop appropriate reward systems to encourage the transference of the new knowledge developed in these CoPs. Reward systems can be used to promote the systematic identification of anecdotal evidence that demonstrates how the capacity of individuals to complete tasks has improved, rather than focusing on the short-term, financial benefit that new knowledge may or may not produce (Wenger and Snyder 2000: 145). A recent study by Esch et al. found that the effective implementation of high-performance HR systems was contingent on fostering a climate of creativity among human capital (Esch et al. 2016). By coupling these types of reward systems with work designed according to the principles of a CoP, HR can help inform and shape a culture within organisations that recognises the value of new knowledge for both the individual and the organisation. These types of outcomes highlight how HR design needs to focus on locating and nurturing knowledge sharing through these systems rather than attempting to extract and control the way know-how operates within an organisation. In order to create a more symbiotic relationship between the repositories of knowledge, the HR function needs to ensure that HR systems are aligned to facilitate the movement of knowledge throughout the organisation, reward innovation and help develop a better awareness of how social capital operates within an organisation (see Fig. 17.2). Furthermore, the effective coordination of these functions by HR can allow an organisation to develop a knowledge-based strategy that allows it to monitor knowledge assets and identify developmental needs

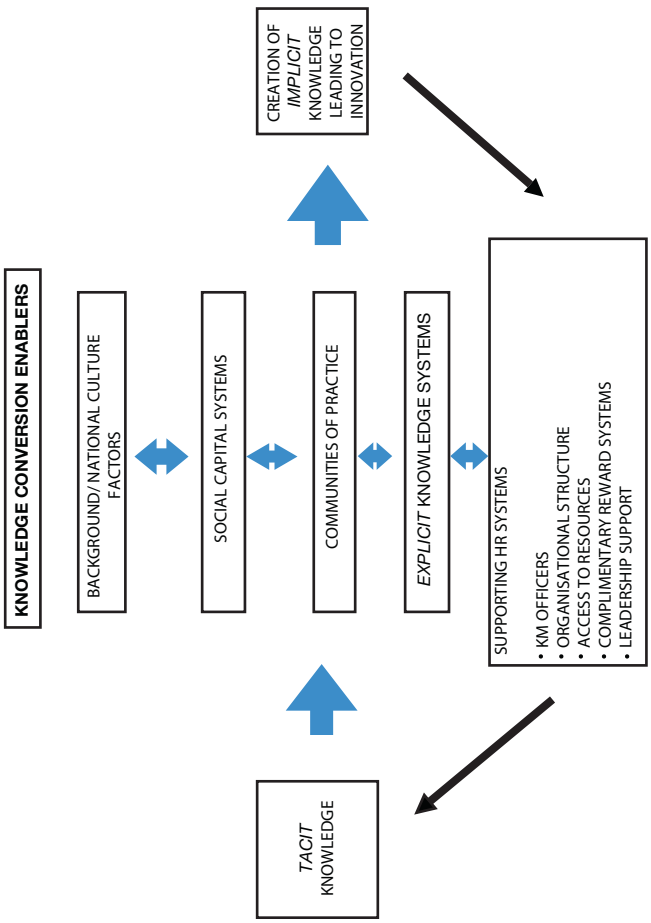

Fig. 17.2 Knowledge transformation process

in order to retain the dynamic capabilities required to respond to changes occurring in the business environment (Andreeva and Kianto 2016).

Conclusions

This chapter has shown that effective KM in modern organisations is difficult to achieve due to an array of interwoven factors that govern the interplay between an organisation, workers and the knowledge repositories which they produce. This is due to both external and internal pressures. The primary external pressure revolves around the dilemma that modern HR departments are charged with having to design HR architecture which promotes KM systems that 'tap' into knowledge that workers possess. As explained in this chapter, a combination of fragmenting working arrangements and the emergence of the gig economy have already impacted the ability of organisations to tap into worker knowledge for several reasons. Firstly, the decline in the level of human capital engaged by organisations has curbed their access to new knowledge. Secondly, there has been an increase in work itself being facilitated by online intermediaries, leading to private transactions between the customer and the worker. As a result, these new forms of work systems allow individuals to become more entrepreneurial by contracting with multiple parties demanding their service. In doing so, they circumvent traditional forms of engagement with organisations, thereby retaining the tacit knowledge they possess.

Coupled with managing these external pressures, HR also faces the challenge of reconciling internal tensions surrounding access to the tacit knowledge of workers. This unwritten know-how that resides with labour itself is a crucial ingredient in innovation. HR constructs, such as the learning organisation, have presumed that workers will be willing to share their banks of knowledge with others in the organisation so that innovation in processes and systems can occur. However, in reality the capture of tacit knowledge via explicit HR systems has been much more problematic than expected. Ironically, this has been in part due to the way in which HR systems have been designed. For example, embedding performance systems that require individual workers to demonstrate their unique contribution, often in the form of applying know-how that others do not have, creates a systemic barrier to the sharing of knowledge. In order to overcome these weaknesses, this chapter identifies the ways in which HR systems architecture, including rewards, organisational structures, resources and more generally the approach that organisational leadership takes to KM, can contribute to an organisation's ability to convert tacit knowledge into valuable know-how and new ideas.

Finally, this chapter draws attention to how KM is influenced by the type of social capital and unwritten rules that govern the interactions between the workers and the organisation. In exploring the role that social norms and cues play in facilitating the sharing of knowledge, this chapter has suggested that embedding the principles of a CoP may act as an important component of the architecture of any HR system in order to better understand how knowledge is generated and to create a more symbiotic relationship between tacit, explicit and implicit forms of knowledge. In proposing a model of knowledge convergence, this chapter encourages both practitioners and scholars to investigate further the relationships between the enablers of knowledge management identified herein, and whether in fact they do deliver innovations that help an organisation remain competitive.

As both product and labour markets continue to evolve at lightning speed, embarking on this work is paramount in order to create a better understanding of the contribution that knowledge creation in organisations can make to individual identity, organisational innovation and even the renewal of society. This chapter has shown that KM may indeed be a difficult task. However, by aligning the processes and systems discussed in this chapter, the HR function can create an organisational architecture that helps to remove the complex set of barriers which often act as an impediment to knowledge sharing. Perhaps these understandings may even lead to a reconsideration of whether the current trajectory towards reordering notions of work and discounting the role organisations play in this process has necessarily been a good thing. Whether the displacement of work by new technologies, coupled with the rise of the gig economy, will create the same opportunities for nurturing innovation that effective HR system design within organisations can provide remains to be seen.

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18

Knowledge Management and Organisational Performance with a Case Study from PDO

Suleiman Al-Toubi and Hank Malik

Introduction

There is growing understanding within business organisations that knowledge management (KM) is important to an organisation's survival and growth. This chapter explores and establishes how KM has helped Petroleum Development Oman (PDO) achieve its business objectives and maintain its competitive advantage.

PDO is the predominant exploration and production company in the Sultanate of Oman. It accounts for about 70% of the country's crude oil production and nearly all of its natural gas supply. The company is owned by the Government of Oman (which has a 60% interest), the Shell Group (which has a 34% interest), Total (which has a 4% interest) and Partex (which has a 2% interest). Gas fields and processing plants are operated by PDO exclusively on behalf of the Government. More details about PDO can be found in Appendix 1.

Extensive research was carried out (Al Toubi 2013) to establish the position and status of KM in PDO. This was achieved through a comprehensive review of current literature in KM, including key KM enablers such as governance, critical success factors (CSF) and so forth. The key literature includes the understanding of KM and its practices and creation by Nonaka and Takeuchi (1995), Davenport and Prusak (1998), Drucker (1999), Dalkir (2005) and others. This

S. Al-Toubi (✉) • H. Malik
Petroleum Development Oman (PDO), Muscat, Sultanate of Oman

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was followed by a thorough literature review on KM tools and systems by Ghasani et al. (2005), Tiwana and Bush (2001) and Andriessen et al. (2009); KM in relation to organisations' performance by Tseng (2010), Bielawski and Metclaffe (2005) and Zack et al. (2009); and KM CSFs by Lehner and Haas (2010), Mouzughi (2012), Migdadi (2009) and Ngah et al. (2009). The review was extended to analyse other considerations including sustainability of KM, KM governance and so forth as discussed by Brewer and Brewer (2010), Cassidy (2010), Chai and Nakata (2011), Hislop (2010) and others. Literature review revealed that KM is now more important than ever and is the subject of considerable scholarly inquiry, with increasing interest in relation to its importance as a continuous performance enabler for organisational benefits. The literature also suggested that KM can play a key role supporting economic competitive advantage, with optimal usage of a focused set of concepts, frameworks, resources and technology to help organisations deliver more value.

Previous research indicated that PDO had various KM building blocks in place but required enhanced coordination and more effective structures to ensure the embedding of KM in all parts of the organisation. It found that a strategic governance structure and senior leadership steerage were required for increased knowledge exploitation. The findings also showed the importance of identifying and understanding the right KM CSFs in order for PDO to leverage the full benefits of KM. The results are discussed qualitatively in the section 'Summary'.

The Role of KM in Business Performance

Citing various definitions of KM, it can be seen that KM plays a key role in the success of organisations, and that organisations are only able to create dependencies and business relationships with other organisations based on their capacity to exercise KM as one of their core values (Garlatti and Massaro 2016). Many organisations have realised that the key to improving production and service is to capitalise on knowledge that leads to innovation, creativity and problem-solving (AlRashdi and Srinivas 2016).

This can be achieved by making the best use of their KM systems, including human resources; commercial, technical and nontechnical human capital; and other niche areas such as deployment of technologies (Al Toubi 2013). In general, KM in an organisation can arise in the form of information sourced from the records (data and documents), and from knowledge (tacit and explicit) such as spreadsheets, presentations and multimedia content. Information production grows exponentially, so failure to manage it properly

may potentially result in harm to the organisation in the form of loss of business revenues, opportunities and 'corporate' memory; inability to assess threats; improper information disclosure; noncompliance with applicable regulations; and so forth. Figure 18.1 provides a simple demonstration of the importance of information processing in terms of business decision making. Knowledge is increasingly being recognised by commercial organisations as a source of competitive advantage (Edvinsson 2000; Johannessen and Olsen 2003; Stankevice 2015).

The rapid acquisition and processing of information and knowledge is crucial to ensure that problems and customers' requirements are addressed in a timely manner (Sedziuviene and Vveinhardt 2015). These attributes can be related to PDO business objectives and were significant for enhancing its business in terms of efficiency and optimum turnaround time for decisions. The twenty-first century is characterised by a knowledge economy (Drucker 2001), and this has given rise to a new type of organisation: the knowledge-intensive organisation. This doesn't necessarily mean that an organisation or a country must be KM strong in their dominant environment; they can find leeway in any KM practice that can bring greater results (Stankevice 2015). With knowledge being a core strategic resource in these organisations, a new approach was needed that could help to effectively manage this new resource, including the ability to recognise intensive knowledge (Koolmees et al. 2009). Before the economic downturn at the end of 2008, the oil and gas industry enjoyed high oil prices, of up to US$147/barrel in July 2008 (Hamilton 2008). This, however, led to rapid and varying erosion of its capability, through staff leaving the industry for other similar industries, moving downstream (to refineries), or for totally different industries. Unfortunately, when these employees leave the organisation, they take with them the knowledge that has been built up over years. Therefore it is important to implement an effective human resources scheme that retains knowledgeable employees (Tan and Nasurdin 2011).

KM has been gaining increasing attention for the last ten to 15 years, including among personnel and management development authors around

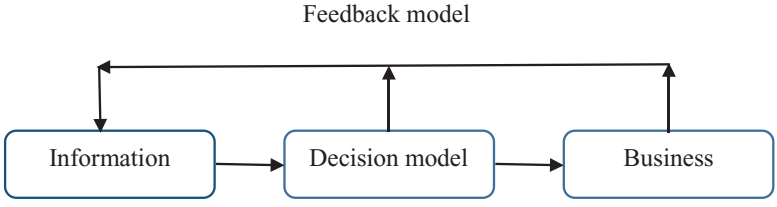

Fig. 18.1 The importance of information (Source: PDO Information code of practice 2011)

the world. Physical assets, such as machinery, buildings and vehicles, form a very small part of these knowledge firms' organisational strength. On the other hand, effective knowledge correlates to better performance management, which can be defined as the guidelines, strategies and systems intended to direct managers' and employees' actions towards the improvement of an organisation's performance and hence to enhance the value for all stakeholders (Chourides et al. 2016). What makes these organisations competitive and profitable is the collective expertise and ingenuity of the people who work for them. Malaysia, on the other hand, changed its economic model by transforming its manufacturing firms from products-based to knowledge-based organisations; together with the understanding of other key dependencies, the organisation becomes stronger in its ability to react to dynamic market conditions through innovation in new products, practices and systems (Tan and Nasurdin 2011).

KM Perspectives in the Oil and Gas Industry

The oil industry mega-mergers starting in the 1990s had different outcomes and produced new categories of industry stakeholders, namely super-mergers and independent oil companies, which resulted in a further reduction of the employment pool. The driving motivation behind the mega-mergers was to position the oil super-majors to compete effectively with the national oil companies (NOCs). The deals also enabled the new mergers to acquire enough assets in size and political clout to explore for and produce oil in difficult regions around the globe. In general, the industry experienced consumer and welfare impacts (Manuszak 2001). The industry represents a key factor in the global economy (Saad et al. 2014) and continues to diversify, and it is a key enabler of nations' competitive advantage, bringing benefits such as employment opportunities, technological trials, oil services and logistical hubs, hence strengthening their presence and opening up a number of other business opportunity streams for local markets.

However, the industry should also ensure that its competitive advantages are protected through management of other factors such as public perception of the industry, industry cyclicality, ageing workforce, negative publicity in political and media events and lack of effective KM strategy. The preliminary study by Bramhandkar et al. (2007) suggests that 'there may be strong relationship between successful development of intellectual capital and organisational performance'; in other words, knowledge, skills and ideas are being used to the advantage of the organisation.

Schiuma and Carlucci (2007) suggest that since any business or operation process is based on the know-how, skills, creativity, attitude and behaviour of the organisation's people, these are core assets for a company's competitive advantage. However, Bramhandkar et al. (2007) argue that while there have been studies on whether and how specific areas of intellectual capital (IC) contribute to better organisational performance, very little work exists on whether better overall IC management translates into better financial results.

In the effort to improve its business and learnings, the industry KM brings competitive advantages to the business (Massaro et al. 2013); in addition, in order to achieve the desired competitive advantage, the industry in general must focus more on both tangible and intangible resources. It is also a common belief that the future of an organisation lies with its people, yet this aspect is often overlooked, particularly with regard to its profound social implications (Bowles and Schoenheimer 2007). This idea is equally important when considering the value of KM, which relies heavily on people and their capability and willingness to share and implement KM as a core value and necessity for business survival.

In view of its business technical challenges and capability (in people and technology), PDO's management was prompted by several factors to actively pursue and review what it called a strategic 'functional review' (PDO 2009) across the organisation. The main factor was PDO's 'portfolio' undergoing a significant transition from conventional to complex oil operations, alternatively called enhanced oil recovery (EOR). This transition is set to continue for decades and requires PDO and the industry to better plan their human resources and capabilities for this evolving and challenging portfolio, which will have an impact on the way PDO works and develops its hydrocarbon systems, processes, procedures and standards. In addition to these portfolio changes, the company's activity levels continue to rise and the risk and complexity of its operations will also increase.

The PDO management has realised that these challenges require the development of fit-for-purpose capabilities and polarisation of resource allocation, in order to be successful in delivering maximum value to shareholders. To effectively achieve this, PDO has divided its concepts into three basic elements, namely people, processes and technology (Al Toubi 2013). These are then linked to the four themes of PDO's KM solution (see Table 18.3).

The development of people's competences and compliance with the right knowledge, experience and mindset will be of major importance in bridging the gap between current and future portfolios. For people working in complex operations environments, additional training and work experience will be required on top of their conventional competence levels. Moreover, knowledge

exchanges and workforce rotation in and out of niche operational environments need to remain a basic rule. Researchers such as Kaufman (1993), Silos (1999), Wilson and Asay (1999), Hall (2001), Binney (2001), Ryan and Prybutok (2001), Bhatt (2000), Moffett et al. (2003), Hung et al. (2005) and Moffett and Hinds (2010) have found that employee involvement is one of the critical factors for KM implementation success. People's work attitudes will become more critical in the coming decade. Methods of stimulating and controlling compliance will become more important. Compliance with processes and procedures is even more critical in high-risk environments, and therefore it is essential to segment some of PDO's processes and procedures for different parts of the business.

The differentiation and segmentation of PDO business requires a change in the approach to selecting hardware and fit-for-purpose technology solutions. The application of equal selection criteria for hardware across the entire business portfolio will either lead to unacceptable risks in the high-risk environment or inflate costs significantly to cater for the high-risk end. The hardware selection should apply right across the board, from heavy mechanical equipment (e.g., drilling rigs and hoists and other heavy drilling services equipment) to modern intelligent control systems, reservoir modelling and plants' material selection (Lamki 2009). Therefore technology and KM play key roles through resources, specific skills and competencies. Records managers, digital archivists, content modellers, information architects and data stewards are necessary in both the information technology (IT) and business units, but these roles should not be staffed just by IT experts, as business skills are required to perform them (Gartner 2009). The individuals who fill these roles must have the proper skills and tools needed to manage information. On the other hand, document management systems, database-oriented storage and accessibility of documents are also essential to enable the technology. This will include new collaborative and social workplace tools to better support the coordination of cooperative work by capturing a repository of information created by a team during their common work, as well as organisation memory information systems that integrate context, documents and unstructured information aimed at enhancing its access and reuse. There are also intranets and extranets that are used to help apply and convey the basic principles of organisational learning. Their success depends on the KM, knowledge transfer and building of essential KM tools where the essential technical and non-technical information resides and can be accessed.

There is a large and growing body of evidence that demonstrates a positive linkage between human capital and organisational performance (Shaw et al. 2013). The emphasis here is on human capital in an organisation, which is

echoed by Bowles and Heather's view (2007) that 'market values depend less on tangible resources than on intangible ones'. Equally, however, the organisation is responsible for encouraging individuals to create a conducive environment in which knowledge can be created and shared, one of the key elements of positive performance contribution.

> KM is about knowledge creation, knowledge storage, knowledge transfer, and knowledge application, which therefore makes KM a dynamic process. There is no one common approach to what the organisation wishes to apply. The deployment of KM and its successes depends upon the nature of the business and the culture of the organisation and its employees. (Al Toubi 2013)

On the other hand, KM is not just about capturing knowledge, but encompasses the whole process of assimilating and disseminating information to create new knowledge (Nonaka and Takeuchi 1995). Therefore people are the key to generating new knowledge and must be given opportunities to identify and assimilate new knowledge. The successful implementation of KM in the industry is highly dependent on the willingness of employees to share their experience and expertise within the system. The industry looks the same worldwide, with drilling rigs, gas stations, oil fields and all other aspects. These items are similar in the USA and in the Omani desert. For example, the technical challenges that oil and gas workers face in Oman and Venezuela are of the same nature, albeit perhaps of different maturity levels, but they can benefit from global knowledge sharing (Al Toubi 2013).

> The growing challenges facing PDO will be similarly experienced by the other oil industries in the region; PDO is just ahead of others due to the maturity of its field, a reality which has been confirmed by the industries' experts. (Rumhi 2015)

Knowledge retention from previous oil and gas projects and lessons learned at different stages can be continuously applied. In an industry where mistakes can be very costly due to tight profit margins, high-risk aversion, contractual fines and the possibility of litigation, as well as an economic environment that is increasingly knowledge driven, the importance of managing information and knowledge to generate a commercial advantage is becoming increasingly clear. Many companies are fine-tuning their best practices transfer process using content management systems and communities of practice to further minimise downtime at field sites across the globe (Leavitt 2002).

> We got into KM because we had so many projects going on that it was difficult to standardize without limiting creativity. … Through KM, different leaders not only share experience and knowledge, but go forward to create what I call 'contamination centres' where people infect each other with ideas. (Rudulfo Prieto, PDVSA, 2002, cited in Leavitt 2002)

The Schlumberger Business Consulting (SBC) university survey of 2014 (SPE 2015) shows that the number of graduating students per million barrels of daily oil and gas production is lowest in the MENA region and highest in Europe. In general, globally there are about 129,000 students pursuing degrees in petroleum engineering (PE), of which 72% of PE students complete a BSc degree only; in Europe, by contrast, almost half undertake a postgraduate degree. However, the MENA region is experiencing shortages of graduates willing to join the industry; for example, in MENA the supply is 500 while the demand is 2800, while in Europe the supply is 2600 while the demand is 600. Europe, Russia and the Caspian Sea region are the main net suppliers of talent. This situation of unbalanced supply and demand in MENA will create strain and have an adverse effect on age profiles, experience and hence KM and knowledge retention.

The SBC survey (SPE 2015) also suggests that the drive for local content exacerbates the talent gap in Russia and the Caspian Sea region, the Middle East and Africa. Table 18.1 summarises the headcount targets set by respective countries for different categories of skills.

Training and mentoring will be important aspects of the strategies of oil and gas (O&G) companies operating in these regions for coping with the talent gap and local content requirements (SPE 2015).

Over the years PDO has worked to improve its organisation through various change programmes, which has led to a number of improvements in

Table 18.1 Headcount requirement of local content

Region	Example	Headcount requirement
Russian & Caspian	Kazakhstan	Management: 70% Technical: 90%
MENA	Oman	General: 90%
Sub-Saharan Africa	Angola	General: 70%
	Ghana	Management: from 30% to 70–80% by 2023 Technical: from 20% to 70–80% by 2023 Others: from 80% to 100% by 2023
	Nigeria	Management: 95% Other O&G functions: 50–100% (depending on specialisation)

Source: World Bank study 2014 (SPE 2015)

workflows, processes and organisational efficiency, strengthening the matrix organisation of 'assets' and 'functional' arrangements and bringing in better practices and closer working relationships across all units. KM initiatives will play a key role in making operations more efficient and effective (Leavitt 2002).

In the current context of stringent regulations, competitive markets, the race for renewables and energy efficiency, smart technology deployment and the potential growth of reliance on foreign workers, the oil and gas industry has no choice but to raise its game to take full advantage of KM development in order to leverage its full potential.

A Case Study of PDO: Why Is There a Need for Knowledge Management in PDO?

Knowledge management is an important solution to support improved continual organisational performance. This can be accomplished by knowledge transfer from accomplished performance, sharing of best practices and lessons learned, connection to experts and high-value information, a lifelong continuous learning environment and knowledge workers who are changing the business (Bielawski and Metcalfe 2005; AlRashdi and Srinivas 2016).

KM is an ideal concept and discipline for stimulating and enhancing the required environment for a learning organisation with the necessary supporting culture. The definition of KM identifies the necessary behaviours to allow knowledge sharing between various entities (Eren 2012) in the organisation who share the same values, with the intention of building competitive advantage (Bielawski and Metcalfe 2005).

Lack of structured knowledge sharing can cause the repetition of mistakes, or failure to take advantage of a great idea. It often results in 'reinventing the wheel' where someone undertakes a project that has already been done elsewhere. It was recognised that as employees move on through attrition (retirement, resignation or new opportunities), corporate knowledge diminishes because their experience and wisdom has not been successfully captured and made available for others to use in the future (Al Toubi 2013).

> Sharing of knowledge takes place in various forms and within teams and departments, and most of all, between people. All are passing on knowledge, all are actively sharing experiences.

> Where we are less good as an organisation is in the capture and retention of this knowledge and in ensuring the sharing and pervasive accessibility by all our staff, present and future. (Restucci 2015)

Bielawski and Metcalfe (2005) and Edvinsson and Sullivan (1996) agree on the steps which the management of any organisation can adopt to take it forward and help it become a knowledge-driven organisation, and hence gain competitive advantage. KM can involve pulling in best-in-class learning from within or outside the organisation. Transparency in terms of mistakes and errors should be considered opportunities in the compilation of improvement cycles, rather than employing punitive measures which can result in the blockage of shared learning.

Communication of KM in an organisation is a key and critical success attribute. Andriessen and van den Boom (2008) point to the use of metaphors as an effective method of enhancement through visuals aids (Andriessen 2011). They argue that other theorists such as Andriessen (2006) have identified metaphors as important ingredients in their efforts to communicate and disseminate knowledge. PDO uses metaphors and cartoons as well as trends and pictures to convey important messages across its multicultural and multilingual workforce. Such messages include developments and news on health, safety and environment (HSE) issues, where staff can be exposed to multiple and varying occupational risks and where understanding of risks and their controls are imperative before work can begin (Al Toubi 2013). However, the risks of misinterpretation of metaphors cannot be ignored, despite the argument of Andriessen and van den Boom (2008) that the power of visual metaphor is that it can create multiple interpretations while providing a common and natural focal point for discussion.

However, while the use of metaphors can be an inspirational way to convey key messages, it is not an all-encompassing solution to effective KM communication. Complex organisational matters such as human resource capability development to address PDO business challenges will require more than metaphors; it will require fixing the competence gaps that exist in order to address present and future varying business challenges (Al Toubi 2013).

PDO believes in the value of KM and adopts its concepts as a way to attract and retain staff. With the introduction of the KM programme into PDO, the emphasis was placed on learning, communication and change management (Malik 2015).

In an attempt to determine whether PDO was exercising KM practices, the author carried out a pilot survey in 2010/2011 to specifically query the ability

to collect and share existing knowledge. The outcome was that 0.6% of respondents strongly disagreed, 18.5% disagreed, 19.1% were neutral, 43.2% agreed, 17% strongly agreed and 2.5% of responses were 'don't know'. This indicates that there is reasonable agreement that PDO has the ability to collect and share knowledge; however, this does not mean PDO practised effective knowledge collection and sharing. The subsequent results section will demonstrate that there is a positive shift of KM deployment in PDO.

The Background

As PDO grew in size and complexity, there was a need to put in place a strategic, consistent and workable approach to KM that could enable it to better identify, capture, share and apply collective knowledge and expertise to foster continuous operational improvements. Following an earlier review of the need to improve knowledge sharing and collaboration, it was agreed by the Managing Director's Committee (MDC) to introduce KM as a new executive-sponsored programme. The business case for KM was built around the need to meet the following challenges:

- to effectively apply operational knowledge, best practices and lessons learned in a more consistent way for operational efficiencies;
- to manage and capitalise on the wealth of information and knowledge in the organisation in order to maximise human capital and enhance operational performance;
- to introduce a formal KM approach with clear governance and processes and a dedicated team to implement best practices and encourage a knowledge sharing culture;
- to transfer knowledge and experience, which was considered very important as experienced mature staff and expatriate contractors moved out of PDO and the rate of Omanisation of key jobs increased.

The Approach Taken

The PDO executives endorsed the introduction of KM with the creation of the KM steering committee group, consisting of senior members from the business project teams with technical expertise, and information management and technology (IM&T), and was led by an appointed KM champion from

the executive team. The KM steering committee group met on a quarterly basis and a new KM operational team was created, jointly sponsored by the business and IM&T, with clearly assigned KM roles and responsibilities (KM synopsis form, April 2015b). Underpinning the programme was a best practice KM framework that formed the corporate KM Code of Practice, which stated clearly the key principles and steerage for KM within PDO (PDO KM Code of Practice CP-20 2015a). The KM team had a specific mandate, which included the following:

1. to appoint a dedicated and experienced KM Programme lead manager to drive KM across PDO. The manager was to report to senior members of the management team and to report to the KM steering committee on KM project progress;
2. to build on the work that had already been done in the various business units, including knowledge sharing practices;
3. to map out new solutions and standards, suitable to the business;
4. to develop an 'enterprise KM framework' and to implement it first in targeted business areas in the form of a small 'pilots' where the impact and criticality were significant, thereby capturing and safeguarding the wealth of knowledge and expertise of staff, reusing it wherever required and making it available to those who might need it later for various projects.

PDO's KM vision was proposed and endorsed by the steering committee as 'WE WILL CONNECT WE WILL COLLABORATE and WE WILL SUCCEED. The ultimate goal was for every PDO employee to have the knowledge and collaboration capability needed to act decisively in delivering enhanced exploration and production productivity, safely and efficiently, for the benefit of the PDO, shareholders and the country. Therefore the setting up of the central Enterprise KM organisation was intended to help transform PDO culture into one where sharing knowledge across organisational boundaries and generational gaps becomes the norm, hence the KM vision. Following the endorsement, it was agreed that KM would first be launched with the pilot project in the central project delivery (CPD) team, where PDO's largest and most complex oil and gas projects are executed, and where learning and improvements in terms of cost, operations and safety can be maximised.

A small dedicated in-house KM team was set up with staff supplied by a combination of the CPD and PDO's IM&T team, who were successfully colocated together.

A short KM maturity assessment was undertaken across CPD with a web-based survey, and based on analysis of the results it was agreed to deliver three pilots in the following areas:

- lessons learned and best practices capture
- communities of practice
- on-boarding.

All three pilots were delivered by a combination of people, processes and technology supported initially by Microsoft SharePoint, and all were recognised as successful and deployed within PDO. Subsequently, four corporate KM streams, discussed in more depth below, were further developed and communicated widely, helping to embed KM more strategically within PDO.

Better Access to the Right Content and Information: On-Boarding

To assist with more efficient on-boarding into CPD, a new on-boarding intranet site was designed, following detailed user requirements analysis, to help staff find the right information and content more quickly and become more effective using more of a 'self-service' model. Detailed focus groups were delivered to capture the requirements of new joiners to PDO facilitated by the KM team and CPD project technical services.

The approach was very successful, having achieved over 2000 hits and 800 members to date, and a range of additional services have been launched, including practical content to help new hires from day one, including a new Glossary of Operational Terms and a practical On-boarding Checklist. The content and on-boarding stream has yielded a number of benefits, including facilitating a new employee's ability to contribute to their role, increasing their comfort level in their new job, encouraging commitment and employee engagement, enabling faster access to the right knowledge and content and finally providing a one-stop shop with all the necessary details for newcomers. There is also evidence of cultural and behavioural improvements, with information management being utilised in building effective KM best practices and processes into day-to-day work habits, leading to effective decision management (Alawi 2016). Following its success in CPD, the KM designed approach has now been used as a blueprint for the corporate HR PDO On-boarding process.

Better Access to Learning and Best Practices: Lessons Learned

To introduce improved consistency in the capturing and sharing of critical learnings at key project stages, the initial pilot involved a detailed business requirements analysis and the development of a new Learning Knowledge Base (LKB), which has now become to become the central repository for all lessons captured across PDO. The knowledge base was initially used by CPD engineering projects teams and has proven to add high value during audits, project close-out reviews, decision review boards and preparation for key stage gate reviews. In addition, the KM team led facilitated lessons learned workshops and designed lessons learned procedures with guidance, training and communication. Where a key lesson learned and actioned is deemed of particular importance, a process in the LKB allows for the learning to be sent to a designated lead technical authority for verification and approval. Hence the KM team has started to build a single PDO 'body of knowledge' for approved key learnings and best practices. To date, over 5000 lessons have been generated by over 50 projects, with substantial cost and cost-avoidance savings of millions of US dollars. Better project delivery practices have been identified, and in some cases the KM team has captured specific processes and procedures improvements which have been integrated into new project specifications (Fig. 18.2).

The success of the KM pilot has been replicated in other priority areas in PDO. Table 18.2 presents a simplified process of lessons harvesting and reuse. Following on from the success of the LKB, the base architecture was used to create a very successful Asset Integrity Process Safety Management solution, called the Incident Data book. It was aimed at capturing major incidents and identifying key supporting learnings from these incidents, to avoid them being repeated and to keep employees and assets safe in the oil fields.

Better Access to Skills and Expertise Capture: People Skills Profiling

To facilitate faster access to PDO skills and expertise, a new enterprise People Skills profile finder was introduced as part of an intranet upgrade. From the beginning of the KM programme, the need for better capture and sharing of PDO skills and expertise was identified as a key need, with KM acting as the

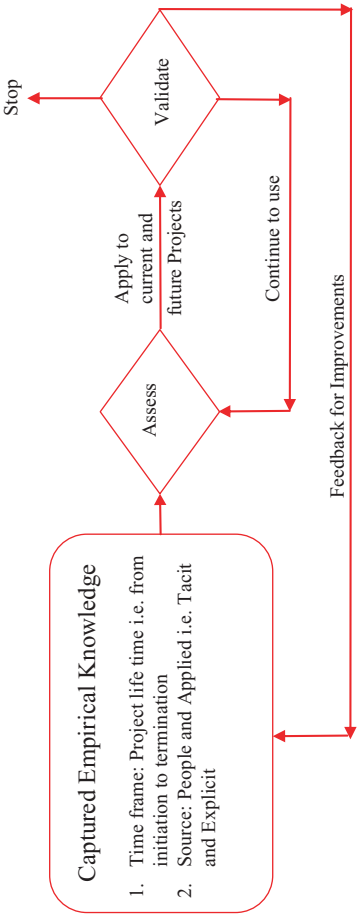

Fig. 18.2 PDO's process of capturing lessons learned

Table 18.2 PDO lessons harvesting and reuse process

Steps	Lessons Harvesting Process	Lessons Reuse Process	Remarks
One	Lessons capturing	Filter lessons that are common to projects for usages	Lessons capturing and usages to and from LKB
Two	Complete Learning template	Lessons learned reuse workshop	Lessons reuse to be implemented as is seen fit and applicable to specific projects
Three	Filled lessons sheets	Take actions on the learning	Collect learnings from various teams
Four	Collated lessons	Declaration of lessons learned benefits	Management decision team is kept informed
Five	Dynamic lessons learned and flaws	Nil	Captured in LKB

Source: Adopted from PDO lessons learned process flow, 2016

'catalyst for change'. Although, of course, managing the profile and keeping it up to date is down to the individual employee, the KM team played an important role in helping with the embedment, communication and change management necessary for success.

The KM team produced a series of supporting documents and aids, including a positioning 'white paper', video training materials, posters and short 'how to training guides'. The team took a phased approach to deployment, starting and working very closely with the PDO Well Engineering and Logistics Directorate. With the support of leadership, this programme was subsequently expanded more widely. The well-designed People Skills finder will prove to be a very efficient way to identify the right expertise at the right time, and enable better communication with experts together with faster, more targeted replies to questions. It is also one of the first implementations of an internal 'social network capability' offered in PDO.

Better Access to Collaboration and Networking: Communities of Practice

Again based on the original PDO requirements, the development and nurturing of communities of practices was a key goal. Numerous 'informal communities' existed within PDO, but there had not been a concerted effort to encourage their growth in a structured way with KM best practices.

Table 18.3 KM solutions

KM solutions helping to add value in PDO		
KM Enabler	Description	Typical Examples
Content management	Better access to content and information: unstructured document and information assets	PDO's process safety data book and enterprise on-boarding
Collaboration	Better access to collaboration and networking, i.e. the ability to connect and network communities and teams	Communities of practice
Skills and expertise	Better access to expertise and skills capture, i.e. the support of the right environment for experts to share	Enterprise people profiles
Learning and best practices	Better access to learning and best practices, i.e. the delivery of lessons learned and best practices	Learning Knowledge Base (LKB)

Source: PDO KM Code of Practice (2015a)

With guidance and steerage from the KM champion, the KM team focused on the development of a structured communities of practice approach to capture PDO's technical sour hydrocarbon gas expertise and knowledge. The dangerous nature of this very poisonous gas (hydrogen sulphide) meant it was vital to capture the critical knowledge and allow technicians to collaborate easily. Eleven sour hydrocarbon technical specialists were identified as key focal points to colead the community, and following business requirements, a community site was developed by the IT SharePoint team.

The KM team implemented a structured method for community development, including a charter with key roles and responsibilities, skills transfer, training and a major launch. This all helped to better identify technical community members to connect together, and to promote, reuse and protect their collective technical knowledge. The community has approximately 800 members, supported by a regular newsfeed service and face-to-face community meetings on topical areas of interest (Table 18.3).

PDO KM Roles and Responsibilities

To ensure success it was essential to have clarity on the roles and responsibilities of key KM stakeholders and those responsible for driving the KM agenda in PDO. These stakeholders are required to pursue an agenda that is coherent, consistent and in synergy across various units of PDO. According to Van Winkelen and McKenzie (2007), there is a need to understand more about how to integrate the various learning initiatives in the organisations, specifically in relation to

those being pursued by knowledge managers and their human resource management colleagues (Van Winkelen and McKenzie 2007). Therefore the responsibilities of key PDO KM staff were agreed in line of KM objectives, and PDO KM Code of Practice (CP-201) as follows.

PDO KM Steering Committee Group Champion chair of the KM steering group and PDO sponsor for KM. This role has ultimate decision-making authority in all KM matters, including prioritisations of deployment of KM. The champion utilises input and advice from various KM practitioners, technical authorities and Information Management and Technology (IMT) experts.

Functional KM Lead senior business sponsor actively involved in governance who supports the goals and the overall approach. This person also provides business KM functional guidance and subject matter expertise, as well as skills transfer delivery to functional business management for implementation.

Functional Programme Champion acts as the key day-to-day management interface with operations.

Functional Transformation Change Lead manages all communications and promotes and acts as the 'change' catalyst, encouraging user buy-in.

Functional Content Manager responsible for content management review, quality, migration and ongoing maintenance.

IM&T Business Analyst undertakes detailed business analysis and acts as the interface between IM&T and the function or discipline. The analyst is responsible for the identification and definition of the knowledge needs of business clients and stakeholders and the determination of knowledge resources to achieve business objectives.

Enterprise KM Programme Lead responsible for the design and development of the enterprise KM programme that will help people identify, create, represent, distribute and share knowledge. Managers at this level translate high-level KM strategies into workable, consistent solutions, standards and processes and are the highest-level technical professionals in KM. They require a broad set of skills across all the key domains of people, process, content and technology, including change management and communications.

Enterprise KM Team a small, centralised KM team acting as a centre of excellence, headed by an experienced KM lead that manages the enterprise or corporate rollout of KM, focusing on governance and strategy.

PDO KM Goals

The KM team identified an initial set of KM goals to help focus the launch of KM in PDO. These included the following (Table 18.4):

- to build a sustainable KM leadership team that would allow PDO to develop and disseminate KM strategies, solutions, standards and best practices for the entire organisation;
- to define a KM organisation, together with roles and responsibilities, in order to improve and embed existing (good) KM processes, and to develop and implement new processes. It was agreed that this would be business-located—that is, KM team members would physically be located on the front line of business, being steered and directed by a central KM team acting as the centre of excellence;
- to make the foundation for the KM approach a working practice and culture, where knowledge sharing is embedded in every activity and is perceived as part of everyone's job. This is a fundamental prerequisite for PDO to succeed in embedding KM, and therefore a focus for the steering committee and working team;

Table 18.4 Sets of enabling conditions

Sl no.	Item	Remarks
01	Provision of ready access to data and information	Together with guidance to its use
02	Encouraging collaboration	By making use of its networks of Corporate Function Discipline Head (CFDH) and Subject Matter Experts (SMEs), as well as enabling and expanding its use of communities of practice, both internal and external
03	Growing our knowledge assets	In people as well as documents and data, by sharing experience, coaching and mentoring, capturing and retaining critical knowledge
04	The ability to make better, faster decisions	By capturing and reviewing learnings and embedding them in its ways of working
05	Produce fit-for-purpose Key Performance indicators (KPIs)	To measure results from the four main elements

Source: Adapted from Nonaka and Takeuchi (1995)

– to establish an enterprise KM architecture to ensure agreed knowledge sharing tools and standards; this defines what will be used to capture, store, manage and retrieve knowledge and information. Based on relevant strategies from the PDO corporate level, a specific set of strategies will need to be put in place to define how to create, capture, share and exploit knowledge and information using the tools and standards defined in the architecture;
– to put in place an enterprise KM framework to build sets of enabling conditions to allow for effective management of organisational knowledge.

These enabling conditions will also help focus on delivery of key PDO strategic business objectives, including cultural matters such as treating knowledge as an asset, thereby harvesting and applying PDO's intellectual capital by leveraging contributions and lessons learned from various PDO strategic projects and develop and foster a knowledge sharing and collaborative culture. Alignment of KM opportunities with other business improvement (BI) initiatives, such as lean programmes, is also key to accelerated KM opportunities and organisational efficiencies (Rabhi 2011).

The success of the KM pilots is now being replicated in other business priority areas in PDO.

Critical Success Factors

This section presents the PDO CSFs which were designed and implemented to further manage the PDO KM programme and help to embed a supportive knowledge sharing culture, at both the proof of concept (PoC) in CPD level and at the enterprise/corporate level (PDO management report 2014).

From PDO's perspective, the aspect of business continuity through loyal, capable and skilled staff becomes a critical success factor. There is a vast amount of knowledge within PDO, but a significant portion of this knowledge is not captured, codified and shared. Most of the knowledge resides in silos with individuals throughout the organisation, and when people move, the knowledge moves with them. Further, the individuals who possess this valuable knowledge are not sufficiently known and broadcasted beyond their organisation, and therefore PDO could not effectively leverage their expertise to assist and work with others, such as their technical advisers or their neighbouring operators in the country and in the Middle Eastern region, to address issues to drive performance (Al Toubi 2013). The key PDO CSFs are shared below.

Governance: In order to manage the KM programme and embed a supportive knowledge sharing culture, PDO put in place a formal KM governance, encouraged and supported by the KM champion. The governance contained the following components as key enablers.

– Knowledge Management Code of Practice: The Code of Practice was produced as the formal foundation document to articulate and steer the recommended approach to introducing KM within PDO and was positioned as a practical working blueprint for deploying a best practice and consistent approach to KM in PDO. It offered guiding principles, governance and recommended actions for implementation and built on the key lessons learned from the earlier CPD pilots, hence making it directly relevant to PDO.
– In addition, the principles of good knowledge capture and collaboration to improve knowledge sharing and dissemination more widely across PDO were introduced with a set of universal core concepts.
– Key to the success of KM was having the recommended supporting skilled KM resources in place in dedicated job roles, which was implemented in PDO.

Enterprise KM Steering Committee: A formal Enterprise KM Steering Committee was created under the chairmanship and steerage of the PDO KM Champion. The Steering Committee closely supported the PDO Code of Practice and was attended by senior stakeholders in the business. Key here was to share insights, achievements and areas for improvement across participating business and to collectively build and maintain the longer-term PDO KM road map. Meeting on approximately a quarterly basis, major proposals and decisions were forwarded to the relevant Senior Board Committee for final endorsement.

Senior leadership and business engagement sponsorship: This is required to ensure there is a focused approach and that there is a clear business need with business drivers and to encourage and seed into the organisation the importance of realising the benefits and to create an encouraging platform where knowledge and lessons learned are shared willingly with a wider audience and are part of organisational practices. The leadership must also ensure that there is continuous personal development and lifelong learning for employees associated with KM in order to attract the right calibre of employees with career aspirations in KM. Furthermore, the leadership must ensure that PDO puts in place a reward and recognition scheme that promotes a joint sense of ownership of the KM programme.

Sustainability: Processes must be defined as part of the development of a knowledge sharing culture through structured approach designed to implement these processes. These would include regular assurance processes that check actual deliverables against set targets of KM plans, and identification and capturing of opportunities arising during the implementation of KM activities.

Management of change process: This is to ensure that no deviations to the agreed plans occur without proper approval, as the results would otherwise be a fragmented and miscommunicated shared vision against the KM programme. Therefore leadership commitment to, and participation and interaction in, the change process is critical for the success of the entire KM programme and for staff motivation.

Measurement: Four key areas for measuring the success of the PoC were agreed:

- project implementation: to determine whether pilot project management-related plans are being implemented as per the agreed plan and resources;
- participation: to determine whether target users and key stakeholders are proactively using and applying the implemented lessons learned and solutions;
- satisfaction: to gauge users' and stakeholders' perceptions of the implemented solution;
- business impact: to determine whether the implemented solutions are generating the intended values.

Technology: The opportunity exists to implement state-of-the-art technology to streamline processes and control information quality. However, the technology needs to be effective and fit for purpose, and organisationally and culturally acceptable, in order to be of the most use. PDO introduced IT tools gradually to support and promote value-added content that can be developed, and created an environment and shared spaces for easy access and sharing of knowledge and lessons learned, for continuous business improvements including creation of new lessons.

> The critical success factor of ensuring an effective KM system in any organisation is then determined by the belief of the organisation and individual in sharing the knowledge but also by the overall effectiveness of the KM system of that organisation. (Al Toubi 2013)

Supporting KM procedures, methods and guidance: A series of supporting procedures and guidance documents are in the process of being developed to

enhance the PDO KM programme with a consistent and standardised approach to implementation. These include procedures for knowledge harvesting and capture of lessons learned, and best practice communities of practices and capture of departing critical knowledge.

KM communications and change management: The success of any KM initiative depends on concerted efforts of people, change and transformation management. Some organisations have had trouble with learning and improving due to communication failures (Schein 1996). A dedicated attempt was made to promote KM through a series of focused actions promoting new PDO KM branding, including a catchphrase or slogan and a new KM logo, numerous awareness sessions, lunch and learn, posters, newsletters, promotional videos and corporate PDO Magazine articles. All of this helped to communicate a consistent message for KM across the company. Within CPD, a recognition scheme was also set up for the most valuable and most active lessons learned contributors to encourage participation.

Results After Three Years of KM in PDO

This section presents results that are based on processes and procedures used during the gathering of primary data and verified by the steering committee. The results are grouped according to the categories of time, cost and processes, including capturing of new lessons learned. The results show a strong outcome, however sustainability and continued efforts are still required in order to realise the full benefits in PDO. Currently PDO project teams have better access to the right knowledge during all phases of projects. There has been significant improvement in the information sharing culture, with improved standardisation, reuse and dissemination of critical information and lessons learned from completed projects. Better project delivery practices are being identified, and processes and procedures are being 'leaned' to deal with highly complex projects that require new technologies and processes. The results, capturing various improvement aspects associated with the project delivery process, are presented below (PDO management report 2016).

Study teams shared that the time they used to spend searching for flaws has been reduced from a couple of weeks to 30 minutes by simply downloading all the flaws in one go.

Projects today find it very convenient to extract lessons in one place, which encourages project engineers to spend a few minutes filtering out lessons relevant to their projects. This has also alleviated resistance by the project teams,

which existed due to time spent in searching for and finding the latest lessons learned.

Unlike the earlier versions, the current lessons learned user interface is designed to provide user-friendly access and simplified downloading options of the lessons, and the PDO tool called the Learning Knowledge Base has become a standard solution within engineering. Projects used to upload lessons into various systems which were restrictive in nature, thus not allowing other project teams to access the lessons. At present, however, this tool has become one single source for lessons learned, best practices and flaws. The LKB tool adds value during project audits and project close-outs, and serves as a common platform and central repository for all lessons learned and for the preparation of project assurances and stage gate reviews.

Before submitting final 'project close-out reports', the project leader ensures that the lessons are uploaded in the lessons learned tool and provides the reference number in the audit tools. This not only fulfils project governance requirements, but also enables the dynamic update of learnings in the tool by each and every project. The maturity of lessons learned have shown their value in cost savings and cost avoidance reported in many of the featured learnings shared within CPD and with the rest of the PDO project teams. LKB enables and empowers employees to identify, share and access key learnings and expertise; it provides a single enterprise-wide knowledge base that supports the 'One PDO' motto through increased transparency of learnings and sharing of best practices.

The adoption and usage of LKB is demonstrated by the availability of 5000 learnings captured from more than 50 projects. The LKB tool has created a solid foundation for an enterprise-wide solution.

The Sour Hydrocarbon Forum has over 800 members and is recognised as a key source for sour hydrocarbon knowledge and harnessing the effectiveness of employees. A regular newsfeed is published for key activities in the Forum, supported by knowledge transfer sessions with expert speakers both internally and externally and supporting communications. This Forum will now be used as a blueprint to introduce a consistent community approach more widely across PDO.

Benefits Achieved

Significant technical, financial and time benefits have been realised in CPD through the adaptation of KM processes and tools. This realisation has come about through quantifiable learnings that have led to the standardisation and

replication of key project components and processes. The spin-off of this is the time savings and efficiencies that have further resulted in increased productivity of processes, improved project management skills among employees, reduced duplication efforts and significant improvement results on project execution. Specific examples of benefits are summarised in the following coded projects:

1. Project CPD-A: improvements in design of breathing apparatus that have led to improved safety management and cost of implementation;
2. Project CPD-B: cost of avoidance through continuous engagements, leading to design simplification and mitigated cost escalations;
3. Project CPD-C: skilled community that led to improvements in lubrication oil varnishing. Liberated time creates opportunities for engineers to spend quality time on every aspect of the project and ensure the project is leaned and designed to be fit for purpose;
4. Project CPD-D: construction material improvements. Similarly to Project CPD-C, engineering time is spent with material experts to ensure there is no overdesign on facilities' material type and that the material selection is also fit for purpose;
5. Project CPD-E: completion of the project seven months early due to reuse and dissemination of critical information, lessons learned from completed projects, enhanced project delivery efficient practices, processes and procedures, and improved engineering design with excellence in execution.

A consolidated approach to enterprise KM that adheres to PDO's KM Code of Practice (CP-201) supports sharing and collaboration across PDO and ultimately supports PDO's pursuit of its safety 'Goal-Zero', that is, no harm to people and no damage to the environment. Following the successful implementation of this in CPD, the same approach is now being out more widely within PDO to help employees accomplish continuous performance improvement.

The KM programme highlights the effectiveness of the business working successfully with IM&T and others, specifically the on-boarding of a new KM team, colocation of team members, and ongoing skills transfer and wider team collaboration. The successful approach to operational KM implemented as a pilot project within CPD will now be replicated on a phased basis across PDO, led by a mandated enterprise KM governance to achieve wider benefits realisation.

The overarching benefit of all this is the pride of the project team, the KM teams and the supporting and management teams in seeing the PoC turning

the PDO project capability into a centre of excellence for delivering projects from initiation to operational phases seamlessly and without compromising on quality, cost and schedule.

Summary

Prior to the implementation of PoC in CPD, in 2010 and 2013 PDO carried out an investigation to establish whether it had a KM solution in place. It based its work on three specific research questions, namely:

1. Does PDO have a KM system in place?
2. To what extent can an effective KM system enhance performance and bring competitive advantage to PDO?
3. What are the KM critical success factors relevant to PDO?

This section attempts to make qualitative comparisons between the semi-structured interviews outcome and the recent reported benefits in CPD after approximately three years of PoC as reported in the section "Results After Three Years of KM in PDO". The interview questions were arranged according to specific themes and topics, and the results were computed using Microsoft Excel worksheets and analysed using the latent content analysis method.

The targeted size of the sample for the semi-structured interviews was ten selected individuals of varying technical and managerial seniority levels associated with KM and business decisions. The interviews were designed to gauge various aspects of KM in relation to organisational culture, leadership, CSFs and supporting infrastructure. The design was also constructed to identify blockers and opportunities to be pursued. The validity of the ten interviews was assured through balanced representation between those directly and indirectly involved with the study of KM.

The feedback from the interviews indicated that the participants recognise that there is a strong relationship between business priorities and KM and that accelerated delivery of the KM agenda should support the delivery of the bottom line (Al Toubi 2013). The evaluation of semi structured interviews against the three research questions revealed five themes: people, process and standards, systems and tools, culture and stakeholders. These themes are summarised below.

People: KM familiarity existed, but the understanding and interpretation between individuals and groups varied significantly. Despite their importance,

the words KM, knowledge sharing and information management were mistakenly intertwined.

Process and standards: The company was missing a KM structure to capitalise upon its wealth of information, experienced individuals and technical opportunities emanating from its various business portfolios. Various respondents emphasised this aspect in different ways and gave their own interpretations and understandings of KM.

Systems and tools: PDO has a good IT infrastructure with good systems and tools (examples include SAP, the intranet and other applications and advanced databases). The system is flexible enough and can be configured to assess different business segments. The participants indicated that the capacity and willingness to make KM fully supported by the IT infrastructure existed, but required enhancements. Therefore, the IT infrastructure should be seen not as a bottleneck to effective KM implementation in PDO but as a key enabler.

Culture: The lack of KM strategy, governance and vision made it challenging to explicitly absorb the real cultural drivers or hinderers, as KM was not at full strength in PDO, as was evident from the interview feedback. However, encouragement to apply KM in business applications was evident. Some of the cultural organisational themes that emerged were that PDO had lost momentum on KM over the years, which was perceived to be due to culture mix effect.

Stakeholders: As for stakeholders' support, it was seen that early engagement was essential to obtain their steering and support, particularly in the following three areas:

- visible management support as an essential element in the areas of support, communication, leading by example and emphasis on the culture of sharing;
- need to define the details of what KM for PDO should be;
- proposal to explore further with the shareholders and management the level of discretion and legal stance on knowledge sharing and its boundary conditions.

With its challenging portfolio, there were compelling reasons for PDO to continuously explore methods and means to improve its business competiveness and to be recognised as the best operator in the country. One of the dimensions that PDO had decided to embed is an effective KM that extracts the best from its people, systems, and processes and technologies. The analysis undertaken between 2011/13 and the results of the earlier pilots indicate that PDO's KM journey is resulting in organisational transformation into a knowledge-creating

company. The leadership, vision, communication, knowledge team, governance and pilot project in PDO have all created an enabling environment for the four themes described in Table 18.3, namely:

- better content management
- better collaboration
- better skills and expertise
- better learning and best practices

Conclusions

The presence of the newly formed KM operational and governance structure has demonstrated tangible improvements in a number of attributes, people, money, performance and safety of project delivery within the central project delivery team in PDO. Starting the KM journey with the proof of concept pilots within a structured KM best practice approach, with the application of tools such as LKB, has increased confidence in the approach and put further emphasis on behaviours of knowledge sharing for a typical and successful KM in the organisation.

PDO's approach utilises the hybrid model (Fig. 18.3 below) using the concept adopted from the model of Zack et al. (2009) and the SECI model adopted from Nonaka and Takeuchi (1995) and has been empirically tested using PDO's four key dimensions of KM practices, namely: (1) the ability to collect and share knowledge; (2) a knowledge creation and sharing culture; (3) the ability to experiment and create new knowledge; and (4) regard for the strategic value of knowledge and learning (Al Toubi 2013) (Fig. 18.3).

This research model has shown empirically that, with carefully chosen test variables and designed field instruments, the desired output to improve organisational performance and KM can be realised, as demonstrated by PDO's pilot project, PoC. The experience of PDO should be considered as an appro-

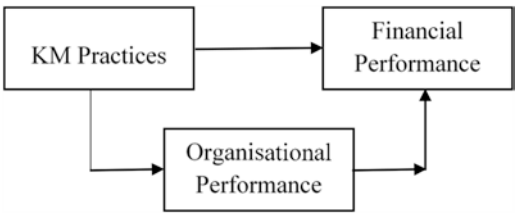

Fig. 18.3 Research model (Source: Zack et al. 2009, cited in Al Toubi 2013)

priate opportunity to demonstrate applied KM in an industry which will help KM practitioners, decision makers and academia to improve upon their understanding, plans, models and strategies.

The identification of critical success factors in a given organisation is also important. PDO had identified a number of CSFs, some of which are commonly known while others were unique to PDO. For example, deployment of clear roles and responsibilities for KM stakeholders, visible leadership support and having a KM reward scheme are important catalysts for a successful KM deployment.

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19

An Exploration of Knowledge Sharing Practices, Barriers and Enablers in Small and Micro-Organisations

Alex Kevill and Bejan David Analoui

Introduction

In a powerful and often quoted statement Burns (2007: 14) rightly argues that 'small firms are not just scaled down versions of large ones'. Indeed, they are fundamentally different with respect to their nature and the unique challenges they face. Similarly, micro-organisations are also distinct in nature (Kelliher and Reinl 2009).[1] Nevertheless, knowledge management research has historically focused overwhelmingly on larger organisations, potentially limiting the insights that can be gleaned from the discipline for small and micro-organisations (Kelliher and Reinl 2009). This, however, is changing. There is a growing tide of research into knowledge management in small organisations and, to a lesser extent, micro-organisations (e.g., Alvarez et al. 2016; Hutchinson and Quintas 2008; Presutti et al. 2011; Roy and Thérin 2008). This literature has highlighted that knowledge management practices in small organisations are qualitatively different to those found in larger organisations (Hutchinson and Quintas 2008; Zieba et al. 2016). Partly as a result of this, Zieba et al. (2016: 292–293) argue that 'there is the need for more extensive research to investigate if and how small and micro companies manage their knowledge'. In this chapter we respond to this call by reporting

A. Kevill (✉)
Leeds University Business School, University of Leeds, Leeds, UK

B. D. Analoui
University of Huddersfield, Huddersfield, UK

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on our empirical study into knowledge sharing in two micro-organisations and one small organisation.

Knowledge sharing (or the transfer of knowledge) appears as a core process in a number of well-known typologies of knowledge management activity (Barth 2003; Becerra-Fernandez and Sabherwal 2014; Hislop 2009; Maier and Mosley 2003) and scholars have argued for its fundamental importance. For example, Puccinelli (1998: 40) has stated that 'to successfully reap the rewards of KM (knowledge management), knowledge sharing is the most important consideration'. Empirical evidence supports the view that knowledge sharing is a key factor in the successful innovation of products and services (Hislop 2005; Jackson et al. 2006), and is fundamental to organizational learning (Goh 2002) and the creation of new organisational knowledge (Nonaka and Takeuchi 1995).

As such, knowledge management and knowledge sharing could be of great value to small and micro-organisations. The importance of researching knowledge management in such organisations, therefore, in order to understand and inform knowledge management in practice in these contexts, becomes crucial. This is especially so since small and micro-organisations play a vital role in economies nationally and globally. For example, at the beginning of 2015, private sector small and micro-enterprises in the UK alone employed more than 12 million people and contributed £1.2 trillion of turnover (Department for Business Innovation and Skills 2015). Furthermore, small and micro-organisations outside of the financial business sector contributed almost half of EU employment in these non-financial sectors (Muller et al. 2015).[2] Clearly, therefore, any benefit that these organisations can gain from the findings of research into knowledge management and knowledge sharing in small and micro-organisations could have important wider economic impacts.

Our focus in this chapter is to analyse the opportunities for, and challenges to, knowledge sharing within small and micro-organisations. In order to achieve this, we specifically seek to achieve the following objectives:

1. develop deep and contextualised insights into knowledge sharing practices in two micro-organisations and one small organisation;
2. understand and analyse the enablers of, and barriers to, knowledge sharing in these settings;
3. embed these insights within wider knowledge management literature and elucidate implications for practitioners and policy-makers.

The Research Study

Our study comprised 13 semi-structured interviews with managers and employees in two micro-organisations and one small organisation based in knowledge-intensive industries. Both managers and employees were interviewed in order to gain a holistic understanding of knowledge sharing in each organisation and to access different perspectives about knowledge sharing. Indeed, in line with the phenomenological orientation of our inquiry, the interviews sought to gain deep understanding of each interviewee's individual perceptions of their lived experience in relation to knowledge sharing in their organisations (Jankowicz 2005; Saunders et al. 2016). We also endeavoured to select interviewees from a diverse range of job roles in order, once again, to access a fuller and more holistic picture of knowledge sharing within the organisations.

Table 19.1 describes the organisations involved in our study and the number of interviews undertaken in each organisation.

The interviews first sought to gain an understanding of the organisation and the interviewee's role within the organisation. Then the interviewer sought to gauge the interviewee's understanding of the concepts of 'knowledge', 'knowledge management' and 'knowledge sharing' before explaining

Table 19.1 Overview of participating organisations and data collection

Company	Micro/ small	Description	Number of managers interviewed	Number of employees interviewed
Architect Org	Micro	Architect Org is an architectural design company offering design and construction detailing of buildings for both professional and nonprofessional clients. The organisation consists of seven individuals, including the company principal.	2	3
Training Org	Small	Training Org offers short training courses and National Vocational Qualifications (NVQ) training, mainly to those based in the care sector. The organisation consists of 12 staff members.	3	3
PR and Marketing Org	Micro	PR and Marketing Org offer marketing and public relations (PR) services for both public and private sector organisations. The organisation consists of four individuals.	1	1

these concepts to them in order to ensure that each interviewee was clear about the concepts they were providing answers about and to facilitate their recall of practices within their organisation. Next, the interviewee was encouraged to provide insights into, and opinions about, the knowledge management and knowledge sharing practices within the organisation. The interviews then focused on gaining insights into barriers to, and enablers of, knowledge sharing as well as the interviewee's perceptions about the effects of knowledge sharing. All interviews were audio recorded and transcribed fully prior to data analysis.

The data analysis process broadly followed a qualitative content analysis approach (Hsieh and Shannon 2005). The analysis began with the transcripts being read thoroughly and in depth in order to immerse the researchers in the interviewee's worldview and to facilitate the fragmentation of the data into broad categories. The categories largely emerged inductively during the analysis process. Once the data were categorised, the researchers identified common themes within each category for each individual organisation, before identifying and understanding the key themes across the three companies.

Empirical Findings

In what follows the manner in which knowledge was shared in the three firms is presented, and the enablers of and barriers to knowledge sharing are outlined. Participants' voices are prioritised to give the reader deeper insights into the realities of knowledge sharing in small and micro-organisations. Throughout, findings are placed within relevant theoretical frames. Readers that are familiar with the field will note many insights and themes commonly reported in the wider literature—we subsequently explore these further.

Knowledge Sharing in Architect Org, Training Org and PR and Marketing Org

Managers and employees in Architect Org and Training Org demonstrated little cognisance of knowledge management as a theoretical discipline, and yet in many cases were able to identify what knowledge sharing is in layman's terms. Furthermore, they were able to discuss and explore the importance of knowledge sharing. When asked if he was aware of the concept of knowledge sharing, the project manager in Training Org stated:

> [Y]es, but probably only in generic layman's terms really, within an organization I would assume that knowledge sharing is around communicating the right knowledge to the right people. (Project Manager, Training Org)

The owner-manager of Architect Org perceived knowledge sharing in the following way:

> I think … I mean within any organization people are working individually on certain things … and it's really pooling that knowledge … to the benefit of the particular project they work on, and then in a broader sense the organization within which they work. (Owner-manager, Architect Org)

By contrast, the owner-manager of PR and Marketing Org was well versed in knowledge management and knowledge sharing. The above quotes provide an important insight: despite lacking a formal grasp of the concepts and abstractions of knowledge management, practitioners are still able to talk confidently about knowledge sharing. Indeed, the interviewer found that much embedded and situated activity within the organisations did constitute knowledge sharing practice—but was labelled with other (or no) names. This reflects Hutchinson and Quintas' (2008) observation that knowledge management practices can be undertaken within small organisations without being labelled as such and without being driven by knowledge management theory as found in the extant literature.

The majority of knowledge sharing activity reported in the three organisations is consistent with the personalisation approach described by Hansen et al. (1999). Indeed, the main approach to knowledge sharing tended to be the use of unorganised, ad hoc, face-to-face exchanges between organisational members. Such activities included responding to questions, informal chatting, demonstrating technical skills, and providing insights and suggestions. These knowledge sharing interactions often occurred in response to specific operational concerns when necessary and possible.

> [T]he idea of sharing knowledge isn't anything that is particularly formalized … it happens because people need something specific or they have a specific problem, they ask somebody else in the office. (Owner-manager, Architect Org)

> [W]e share knowledge and skills as well to help each other day-to-day, if there's something somebody can't do on the computer or something technical we all help each other. (Public relations operative, PR and Marketing Org)

Table 19.2 Formal/organised knowledge sharing practices in the organisations

Organisation	Personalisation	Codification
Architect Org	Mentoring to support new architects and technicians	Use of a central document store
Training Org	Mentoring and buddying activities	
PR and Marketing Org	Weekly staff meetings Interactive role plays	Web-based portal for storing client files Creation of an organisational rule book

There were also reports of more organised personalisation approaches such as regular meetings, and mentoring programmes in which new employees were paired with experienced employees. Attempts to move towards formal codification (Hansen et al. 1999) of some physical documents were also reported within two of the organisations (see Table 19.2).

The informal and unorganised approach to knowledge sharing adopted by the firms in the present study is consistent with prior literature. It has been demonstrated that small and micro-organisations often manage and share knowledge in an informal and unplanned manner (Alvarez et al. 2016; Hutchinson and Quintas 2008; Lim and Klobas 2000; Nguyen and Burgess 2014; Zieba et al. 2016). However, as we have demonstrated above, each firm in the study also engaged in formal personalisation and/or formal codification practices.

Knowledge Sharing Enablers

Our empirical data revealed four interrelated enablers of knowledge sharing: (1) a desire on the part of managers to develop organised knowledge sharing approaches; (2) practitioners' recognition of the importance of knowledge sharing; (3) practitioners' motivation to practise and participate in knowledge sharing; (4) close proximity and social relationships between practitioners. Each of these will be discussed in turn.

First, our data revealed dissatisfaction among some managers with some of the unorganised knowledge sharing practices taking place within their organisations. Such unorganised approaches could lead to some people not receiving the knowledge and the essence of a piece of knowledge being changed during multiple rounds of person-to-person knowledge sharing. It is perhaps unsurprising, therefore, that we found that in the three cases described there was a desire to transition to more formalised and organised knowledge sharing practices. Indeed, a number of managers desired greater structure and

organisation in knowledge sharing within their organisations, as illustrated in the following interview extracts.

> [It is] essential that we do move it to a more central, a more controlled, way of sharing it, so that people are using up-to-date information, people are using the same information and people aren't doing something twice. (Office manager, Architect Org)

> [M]y honest opinion is that every three months or so that we all get together, every single person that's involved in the company. (NVQ centre manager, Training Org)

> [W]e should have more staff meetings than we do but we have some. (Company manager, Training Org)

This management support for the development of organised knowledge sharing could prove to be a valuable enabler of knowledge sharing within the organisations and particularly for transitioning to a more organised knowledge sharing approach. Indeed, Davenport et al. (1998: 54) found that 'strong support from executives was crucial for transformation-oriented knowledge projects', with Wong and Aspinwall (2004: 49) suggesting that owner-managers of small and medium-sized enterprises (SMEs) 'can be the main engine for change in the organization, provided that they recognise the importance and potential of KM'. Wong (2005) also identifies management support as vital for enhancing knowledge management in SMEs.

The management support for more organised knowledge sharing that we identified suggests that these managers recognise the importance of knowledge sharing. Indeed, we found that all practitioners interviewed for our study—both managers and employees—recognised the importance of knowledge sharing, mainly due to the organisational performance benefits emanating from knowledge sharing. Nevertheless, some benefits for individuals were also cited. These practitioner beliefs in the importance of knowledge sharing represent the second enabler of knowledge sharing that we identified from our study, and are illustrated in the following interview extracts.

> [I]t's important that this knowledge and experience is disseminated just so that, you know, we don't make mistakes, but also that people are actually involved in what we do. (Owner-manager, Architect Org)

> I feel it's really important, it's essential, I don't think organizations can function without it. (Project manager, Training Org)

> [I]t aids the organization as a whole and it can aid the individual by empowering them, making them more confident, and they can use their initiative if they've already got the previous solid base of knowledge. (Trainee accounts administrator, Training Org)

> [M]otivation's the biggest one, massive impact motivation and feeling involved, and I think that's the biggest thing, people actually feel like they own something or that they've played a part in that, and also that three heads around a table are better than one … so actually having a bit of a forum here before we take it to the client. (Owner-manager, PR and Marketing Org)

These quotes demonstrate participants' recognition that knowledge sharing can enhance individual and organisational performance, produce a sense of community and involvement among employees, and enhance individuals' confidence. The importance the practitioners place on knowledge sharing leads logically to the third enabler identified by our research—practitioners' motivation to practise and participate in knowledge sharing. Sociocultural factors—such as trust issues (Davenport and Prusak 1998; Holste and Fields 2010), unhelpfulness (Cross et al. 2006) and conflict—can be significant barriers to knowledge sharing (Hislop 2005). As such, the motivation for knowledge sharing that the practitioners espoused in our study bodes well for knowledge sharing activities, and potentially for transitioning to more organised knowledge sharing, within these three organisations.

The fourth knowledge sharing enabler we identified—close proximity and social relationships between practitioners—may also be a factor in the knowledge sharing motivations of those within the organisations. The following interview extracts, provided in response to questions about factors that supported knowledge sharing in their respective organisations, demonstrate the close social relationships between practitioners.

> [A]part from one I've known them all the six years … we're all like-minded characters. (Architectural technician, Architect Org)

> [W]e're all in the same room … we know each other … we have banter in the office. (Company manager, Training Org)

Holm and Poulfelt (2003) believe that because individuals in SMEs know each other, they can be more motivated to practise knowledge sharing. As such, the close proximity and social relationships we identified could be an important enabler of knowledge sharing in the organisations. Furthermore,

this factor could also facilitate a transition to more organised knowledge sharing, since 'a unified culture can provide small firms with a strong foundation for change, such as implementing KM' (Wong and Aspinwall 2004: 51).

Knowledge Sharing Barriers

The main barrier affecting knowledge sharing in the three organisations was that opportunities to share knowledge were limited by time constraints. In short, participants were sometimes too busy with other tasks to engage in knowledge sharing.

> [T]he younger members of staff will ask the older ones but they are often constrained by the fact that they know people are busy and they've got deadlines to meet. (Owner-manager, Architecture Org)

> [B]arriers are time constraints, people not being together often enough … I think it's just that everybody has their own remit and they're all so busy doing that. (Assessor/administrator, Training Org)

> [T]ime, that's the major one (barrier), it's my time and it's me, I've been the biggest barrier to knowledge sharing in this company. (Owner-manager, PR and Marketing Org)

This suggests that practitioners need to focus on important everyday operational tasks to safeguard the performance of their organisations, and that this at times has overwhelmed efforts to share knowledge. This seemingly represents a situation where knowledge sharing is ranked as a lower priority than these other tasks.

> [T]here's always bigger priorities in the company, you know, bringing a new contract in … and it kind of slips down the pecking order … it isn't one of the important things but it should be … but I think it's, you know, if you are fighting to get the contract in, you're thinking 'oh, you know, what are we going to do in three months', you know, it's not going to be top of your agenda. (Owner-manager, PR and Marketing Org)

Such a situation is somewhat paradoxical given the importance placed on sharing knowledge by all organisational members, and their recognition that effective knowledge sharing can have both individual and organisational benefits. Nevertheless, extant literature has also suggested that limited time

availability can negatively impact knowledge management in smaller organisations (e.g., Chan and Chao 2008; Egbu et al. 2005; McAdam and Reid 2001; Wong 2005), and Lim and Klobas (2000: 423) have suggested that managers in smaller organisations 'tend to focus on the core business of their organisations and pay less attention to other issues'.

The second and final barrier identified in Training Org and PR and Marketing Org was that at times the most senior manager within the organisation displayed an inability to fully appreciate the knowledge level and knowledge requirements of others within the organisation. This manager sometimes assumed that other individuals had a higher level of knowledge than was actually the case. This acted as a barrier, with some necessary and desired knowledge not being shared with others for the simple reason that the requirement to do so was not recognised.

> [M]y problem was the things that I see as being natural … some people don't, so communication or thinking about how this sounded or smiling, you know, when you see someone, you know, like basic things that I found basic, other people don't necessarily find those to be basic, so we came up with a PR and Marketing Org rulebook. (Owner-manager, PR and Marketing Org)

> [S]he (the company manager) has so much knowledge and she knows so much about everything that she deals with, that it's all matter of fact to her and she doesn't register the fact that maybe I know nothing about that … knowing absolutely nothing about it she gives me that little bit of information and it means nothing. (Assessor/administrator, Training Org)

This factor could be detrimental where organisations seek to transition to more organised knowledge sharing approaches—a transition that, as mentioned above, appears to be desired by a number of managers in the three organisations in which we conducted research. If such organised approaches are not fully informed by an accurate understanding of the knowledge levels and requirements of practitioners within the organisations, then they may be inappropriately designed, thus hindering rather than aiding knowledge sharing. Nevertheless, in PR and Marketing Org the owner-manager's recognition of her misunderstanding of others' knowledge requirements was seemingly helpful in facilitating such a transition in that it actually prompted the creation of an organisational rulebook—an externalisation (Nonaka and Konno 1998) and codification of knowledge (Hansen et al. 1999) that could then be used as part of formal knowledge sharing practice.

In this section we have sought to address the first two research objectives set out at the beginning of this chapter. The first objective was achieved by providing insights into knowledge sharing within one small and two micro-organisations. In summary, knowledge sharing practices tended to be unorganised, ad hoc and face to face, although some formal personalisation and codification practices (Hansen et al. 1999) were undertaken. The second objective was achieved through our identification and analysis of a number of enablers of, and barriers to, knowledge sharing in the organisations. Knowledge sharing enablers included managerial desires to transition to more organised knowledge sharing, practitioners' recognition of the importance of knowledge sharing, their motivations to participate in knowledge sharing, and close social relationships. Knowledge sharing was inhibited by a lack of time and a focus on other tasks, and in some cases knowledge sharing was also inhibited by top management not understanding the knowledge needs of others.

Discussion

Our first two research objectives were satisfied by gaining these in-depth understandings of knowledge sharing practices, barriers and enablers within one small and two micro-organisations. We now address the third objective by further embedding the insights from our empirical research within wider knowledge management literature. In so doing, we focus particularly on whether the barriers and enablers identified in our study are really unique to small and micro-organisations or whether they mirror barriers and enablers found in larger organisations.

Are Barriers and Enablers in Small and Micro-Organisations Really Different to Those in Larger Organisations?

Knowledge management research has traditionally focused on larger organisations, and yet scholars such as Kelliher and Reinl (2009: 522) highlight that micro-organisations are unique and that distinctive elements of these organisations 'render many of the theories derived from studies of larger businesses inappropriate when applied to micro-firms'. However, prima facie our research suggests that there are few differences between the enablers and barriers described in our research and those found in the general knowledge management literature.

The first enabler we identified—the desire to formalise knowledge sharing—is supported in the general knowledge management literature. It is well recognised that strong support from organisational leadership positively influences knowledge sharing (Park et al. 2015; Seba et al. 2012). More specifically, researchers have demonstrated the importance of having a vision of knowledge management that orients action and inspires and enthuses participation (De Loo 2006; Nonaka et al. 2000; O'Dell and Grayson 1998; O'Neill and Adya 2007; Pan and Scarborough 1999; Viitala 2004). Indeed, Nonaka et al. (2000) state that:

> It is top managements' role to articulate the knowledge vision and communicate it … the knowledge vision defines what kind of knowledge the company should create … the knowledge vision gives a direction. (Nonaka et al. 2000: 23)

Furthermore, the demonstration of the organisation's commitment to knowledge sharing among all relevant stakeholders helps to clarify the organisation's expectations of knowledge sharing (O'Neill and Adya 2007), and the promotion of the vision can be undertaken at all organisational levels (O'Dell and Grayson 1998).

Our study also found that practitioners' recognition of the importance of knowledge sharing and their motivation to practise and participate in knowledge sharing are important enablers of knowledge sharing in the organisations in which we conducted research. Nevertheless, the general knowledge management literature has also found that an individual's recognition of the importance of knowledge sharing can be an important enabler for motivating knowledge sharing. For example, researchers have found that individuals will often share knowledge with others because they believe it to be in the public interest and feel they have a moral obligation to help their organisations and professional communities (Ardichvili et al. 2003). Indeed, Ardichvili et al.'s (2003) study of virtual communities of practice at the US firm Caterpillar Inc. revealed that individuals often did not share knowledge with others if they were concerned that the knowledge might lack value for the recipient or thought that it might mislead others.

Given the deeply embedded human nature of knowledge (Polanyi 1966), the sharing of knowledge cannot be considered automatic and does not happen unwillingly (Ehin 2008), and it is influenced by the attitudes and feelings of individuals (Barachini 2009; Ehin 2008). It has been well established that knowledge sharing only occurs willingly (Barachini 2009; Bock and Kim 2002; Ehin 2008). Thus, the motivation of practitioners to share knowledge

is a crucial enabler of knowledge sharing in organisations of all sizes, not only small and micro-organisations.

The final enabler—close social relationships—is also often reported in the literature. It has been found that affect-based interpersonal trust (characterised by warm personal relationships (McAllister 1995)) is positively related to knowledge sharing in a number of contexts (Chowdhury 2005; Holste and Fields 2010; Lucas 2005; Seba et al. 2012). In terms of the principal barrier we identified—lack of time to engage in knowledge sharing due to pressing operational requirements and an overriding necessity to ensure the viability of the business—a lack of time has been found to be a barrier in other studies as well (Hislop 2009; Riege 2005; Seba et al. 2012).

While the foregoing discussions suggest that the barriers and enablers of knowledge sharing may be similar irrespective of organisational size, to interpret the above similarities as implying that the barriers and enablers are the same as those within medium and large organisations is too strong a conclusion. Our contention, supported by our findings and a review of the literature, is that while the relevant enablers and barriers may not be different in small and micro-organisations, *they have an enhanced significance* in this context. We discuss this further in section "The Enhanced Significance of Enablers and Barriers in Small and Micro-Organisations".

The Enhanced Significance of Enablers and Barriers in Small and Micro-Organisations

As we can see from our research findings, managers in the participating organisations are central to many of the enablers of knowledge sharing. For example, managers generally desired a transition towards greater formalisation and organisation of knowledge sharing and also recognised the importance of knowledge sharing. While the important role that leaders can play in knowledge sharing has been acknowledged in the extant literature (Park et al. 2015; Seba et al. 2012), and while managers in larger organisations can also undoubtedly be important enablers of knowledge sharing in their organisations, we would argue that in small and micro-organisations individual managers are generally likely to constitute a more significant enabler of knowledge sharing due to the exaggerated level of control and power that they typically have. Indeed, it is widely acknowledged that owner-managers of small organisations often have a uniquely strong degree of control over their organisations (Burns 2007; Schlemmer and Webb 2008) compared with managers of larger organisations. This is also the case in micro-organisations (Devins et al. 2005;

Kelliher and Reinl 2009), although arguably such control may well be even further exaggerated in micro-organisations and very small organisations, given the greater centrality of the owner-manager to such organisations. Kelliher and Reinl (2009: 523), for example, note that 'the owner [of a micro organization] plays a pivotal role in the organization's focus and ultimate success', with Devins et al. (2005: 541) also highlighting that 'managers within micro enterprises are particularly well placed to influence the development of their organisations'. Therefore, if individual managers and owner-managers of such organisations do not recognise the importance of knowledge sharing and are not keen to organise knowledge sharing in their organisations, then these individual managers have the power and control to significantly diminish the potential for knowledge sharing to flourish in their organisations. In larger organisations, individual managers generally form part of a larger management group, which potentially reduces the possibility of any one individual manager or any small number of managers wielding enough power to significantly influence the knowledge sharing trajectory of the organisation.

If individual managers in small and micro-organisations can be crucial enablers of knowledge sharing within their organisations, then it stands to reason that they could also act as significant barriers to it. Our data provide some insight into this, for example, the problems caused by owner-managers' incorrect assumptions about the knowledge base and knowledge requirements of those to whom they were transferring knowledge. Upper-echelons theory (Hambrick and Mason 1984; Hambrick 2007) provides a helpful lens through which to analyse this barrier in order to appreciate the potentially severe implications of such errors of judgement. At the core of upper-echelons theory is the notion that managers' perceptions of the world affect their strategic actions (Hambrick and Mason 1984; Hambrick 2007). Transitioning to more formalised and organised knowledge sharing, as is desired by a number of the managers involved in our research, is likely to constitute a significant strategic action in a very small or micro-organisation. Therefore, if owner-managers wrongly perceive the knowledge requirements of others in their organisation, this could wrongly inform their actions when it comes to developing more formalised knowledge sharing and this, in turn, could lead to a waste of time and resources that small and micro-organisations can ill afford. We are certainly not arguing that misperceptions among top managers in large organisations are insignificant influencers of strategic action, but we would contend that there is arguably more potential that these misperceptions can be mitigated by insights provided to these managers by other members of their larger management team. As such, we suggest that managers' misperceptions of the knowledge requirements of others could constitute a more significant barrier

to knowledge sharing in small and micro-organisations than may be the case in larger organisations.

Roxas et al. (2014: 445) argue that 'although a small firm may have other employees, the owner-manager plays a major and dominant role in terms of KM within the firm'. While we do not disagree with this sentiment, we do caution against naively negating the role of employees in knowledge management within such organisations. While managers are likely to have more control than their employees, the uniquely small number of employees in such organisations ultimately means that individual employees also wield significant power over the knowledge sharing dynamics within small and micro-organisations. For example, an unwillingness to undertake knowledge sharing on the part of just one employee in PR and Marketing Org would mean that 25 % of individuals in that organisation were disrupting effective knowledge sharing. Clearly, this would have a significant disruptive influence on effective knowledge sharing in that organisation. This highlights the importance of one of the enablers of knowledge sharing we found in our study, which was a willingness among practitioners in the organisations to participate in knowledge sharing. While we also acknowledge that such willingness is important in organisations of all sizes, we would argue that it becomes more significant in small and micro-organisations since the small number of employees in these organisations enhances the severity of the effect that each individual employee can have on knowledge sharing.

The small number of employees in small and micro-organisations also suggests that close proximity and social relationships between organisational members—the fourth enabler of knowledge sharing we identified—may also be more likely to be found in such organisations. Therefore, this enabler could potentially have a greater role and significance for effective knowledge sharing in small and micro-organisations when compared with larger organisations.

According to upper-echelons theory, 'executives act on the basis of their personalized interpretations of the strategic situations they face, and … these personalized construals are a function of the executives' experiences, values, and personalities' (Hambrick 2007: 334). The role attributed to values here is insightful for considering a potential underlying contributor to lack of time and busyness interfering with knowledge sharing in the organisations featured in our study. At the core of the time barrier within these organisations appears to be the prioritisation, among individuals within the organisations, of business survival, financial performance and/or the effective completion of their specific job or remit. This prioritisation could be seen to be a reflection of the values of those individuals. Indeed, the values held by individuals reflect what they see to be desirable (Athos and Coffey 1968; Parks and Guay 2009;

Rokeach 1973; Schwartz 1994; Watson and Barone 1976). Kluckhohn (1951: 395) expresses this when he suggests that a value is 'a conception, explicit or implicit, distinctive of an individual or characteristic of a group, of the desirable which influences the selection from available modes, means, and ends of action'. From our research findings it would appear that at least some individuals in the organisations valued business survival, financial performance and/or completion of their own job more highly than they valued effective knowledge sharing in their organisations. Like Hambrick (2007), other scholars have highlighted the effect that individuals' values can have on strategic actions in organisations (e.g., Guth and Tagiuri 1965; Lichtenstein and Dade 2007; Sousa et al. 2010). As such, when evaluating the mechanisms underpinning the time barrier to knowledge sharing, it could be that individuals' values can act as an important enabler of, or barrier to, knowledge sharing. The effect of individuals' values could arguably be stronger in small and micro-organisations, given the small number of people influencing strategic actions within those organisations. Indeed, small and micro-organisations are often seen to be closely intertwined with the values of owner-managers, with the organisations commonly reflecting those values (Dawson et al. 2002; Greenbank 2000; Holt 2012; Kelliher and Reinl 2009; Olson and Currie 1992). Furthermore, small and micro-organisations typically face resource constraints, including time constraints (Bridge and O'Neill 2013; Wong 2005), which may make the time barrier more significant in such organisations.

Conclusions and Implications

While the arguably logical notion that 'the larger the organization, the greater the potential challenges to some of the key knowledge processes such as knowledge sharing' (Hutchinson and Quintas 2008: 135) may have some truth, this is not a sufficient reason to avoid seeking understanding of knowledge sharing in small and micro-organisations. Our preceding discussions contribute to debates on knowledge management by suggesting that the particular characteristics of small and micro-firms—such as the high level of control by owner-managers (Burns 2007; Devins et al. 2005; Kelliher and Reinl 2009; Schlemmer and Webb 2008), small number of individuals (Muller et al. 2015) and resource scarcity (Bridge and O'Neill 2013; Wong 2005)—may mean that the significance of some enablers of, and barriers to, knowledge sharing are increased in such organisations. Therefore, small and micro-organisations face important challenges to effective knowledge sharing

that must be acknowledged and addressed. The importance of knowledge sharing and knowledge management to organisations (Becerra-Fernandez and Sabherwal 2014; Goh 2002; Hislop 2005; Jackson et al. 2006; Nonaka and Takeuchi 1995) is well established and so too is the fundamental importance of small and micro-firms to global economies (Department for Business Innovation and Skills 2015; Muller et al. 2015). Therefore, developing and determining methods of enhancing knowledge sharing within this context may have significant economic benefits. As such, we argue that researchers may fruitfully explore knowledge sharing and other knowledge management processes within small and micro-organisations. This is particularly salient given that there is a dearth of literature on the management of knowledge in such organisations (Durst and Edvardsson 2012; Zieba et al. 2016).

Having established this stance, we conclude by addressing the final part of the third objective of this chapter, which is to consider the implications of our findings for practitioners and policy-makers:

- There is broad acceptance that effective knowledge management will create competitive advantage for firms (Bogner and Bansal 2007). Nevertheless, a number of participants in our study reported not having time to engage in knowledge sharing and a need to prioritise other core business activities. Prioritisation of such core business activities is understandable and can be pervasive in such organisations, since time constraints are commonly found in small and micro-organisations and their limited resources can leave little scope for a downturn in business (Lim and Klobas 2000). Despite this, we believe that policy initiatives and those responsible for training managers and employees in small and micro-organisations should seek to raise awareness and understanding of the relationship between knowledge management practice and organisational success. Sparrow (2005: 137) argues that SMEs think 'only in terms of what is tangible—cashflow, market share, etc.' and that this can be detrimental to the development of knowledge management. The participants in our study did believe in the importance of knowledge sharing for individual and organisational success, with management often keen to develop more organised approaches to knowledge sharing. Nevertheless, we would suggest that these beliefs could be harnessed and built upon to further enhance managers' and employees' awareness of the importance of knowledge sharing. If those in smaller organisations do think 'only in terms of what is tangible' (Sparrow 2005: 137), then perhaps case studies that illustrate the financial successes reaped by other organisations' knowledge sharing practices could help to further increase the desirability of knowledge sharing, and particularly organised

knowledge sharing, among practitioners in small and micro-organisations. This could help to equalise the prioritisation given to both core business activities and knowledge sharing within organisations. In essence, managers and employees may come to see knowledge sharing, and particularly organised knowledge sharing, as a core business activity in its own right.

- We do acknowledge, however, that it is perhaps idealistic to assume that the time barriers in small and micro-organisations can be overcome simply by further educating practitioners in these organisations about the importance of knowledge sharing and its potential links to organisational success. Transitioning to more organised knowledge sharing practices could be resource- and time-intensive in the short term, and where this conflicts with time constraints in small and micro-organisations, such transitions may need to be undertaken on a very gradual basis. Furthermore, we also advocate the development of knowledge sharing solutions that can be adopted by small and micro-organisations within minimal time frames. Another option is to enhance the informal, unplanned sharing of knowledge in these organisations. It is accepted that communication between individuals is necessary for the successful externalisation of tacit knowledge between individuals (Nonaka and Konno 1998; Nonaka and Takeuchi 1995; Politis 2003). Thus, enhancing the communication skills and abilities of those that work in small and micro-organisations may enhance such unorganised and informal knowledge sharing practices.
- In two of the organisations in our study, a barrier to effective knowledge sharing was the potential for managers to not appropriately identify the knowledge levels and requirements of others within their organisations. Managers in small and micro-organisations need to be cognisant of this, and one avenue to enhancing their awareness of the knowledge requirements of others is through undertaking effective two-way knowledge sharing. Indeed, adequate two-way communication could help to ensure that all employees' knowledge needs are known. It is important, however, not to put the onus for this solely on the shoulders of managers. Employees have a responsibility to effectively communicate their knowledge requirements to management in order to facilitate an exchange of knowledge pitched at a level that is appropriate for those employees. The close proximity of practitioners within small and micro-organisations is conducive to enabling this two-way communication to flourish. To achieve this would require careful management of the relationships between managers and employees, something that is even more important given the general closeness of managers and employees in small and micro-organisations.

Notes

1. In this chapter, micro-organisations are considered to be those with up to nine employees and small organisations are those with ten to 49 employees (Muller et al. 2015).
2. The financial business sector includes 'financial services, government services, education, health, arts and culture, agriculture, forestry, and fishing' (Muller et al. 2015: 7).

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20

Knowledge Management in Small and Medium-Sized Enterprises

Susanne Durst and Guido Bruns

Introduction

The role of small and medium-sized enterprises (SMEs) as engines of economic growth is undisputable. Small businesses are the most commonly found size of business around the world; in fact, in all countries, large businesses represent less than 5% of the enterprise population. In the European Union (EU), two-thirds of employment is provided by SMEs. In Europe, 99.8% of all enterprises are SMEs. Thus only 0.2% of all firms are large enterprises with more than 250 employees (European Commission 2013). SMEs are therefore an important driver of economic growth, employment, technological development and structural change.

Based on arguments that the economy is rapidly becoming a global marketplace characterized by fierce competition, increasing consumer demands and the need for value-added products and services, companies will only survive in such an environment by differentiating themselves through continuous innovation in order to improve their processes, products, services, networks and reputation.

S. Durst (✉)
School of Business, University of Skövde, Skövde, Sweden

Department of Business Administration, Universidad del Pacífico, Lima, Peru

G. Bruns
Incipere, Lindau, Germany

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For this to take place, knowledge is important. However, due to the decreasing 'half-life' of knowledge, smaller companies are permanently challenged to create new knowledge and not to adhere to old knowledge (Gupta and Govindarajan 2000). Thus, the continuous generation of new knowledge is important to carry out strategic changes within the company in order to address the permanently changing environment (Inkpen 1996). This also underlines the critical need for a systematic approach to knowledge management (KM). KM can be viewed as a systematic way of creating, sharing and leveraging knowledge within and around organizations (Bounfour 2003). This stipulates that KM has a long-term orientation and can contribute to the sustainability of organizations (Chow and Chen 2012)—an issue of critical importance for smaller firms given their comparatively high failure rate (Beaver 2003).

Against this background, it is surprising that the study of KM usually deals with KM practices as found in large companies or large departments (Durst and Edvardsson 2012). In fact, it would be dangerous to transfer measures developed for larger companies to SMEs; this will not work in the context of a small firm that follows other rules (Durst and Wilhelm 2012).

Therefore, this chapter attempts to summarize the current body of knowledge regarding KM in SMEs in order to further raise awareness of the need to study KM in these categories of firms. Given the relevance of SMEs for the prosperity of the majority of countries, advancing this awareness is of utmost importance.

In the following, important domains relevant to awareness creation are briefly introduced. More precisely, the chapter commences by discussing the definitions of SMEs using quantitative and qualitative features. This is followed by a section that introduces KM practices in SMEs. Following this, reasons for and benefits of KM for SMEs are presented. In the final section, the conclusion is presented as well as a number of promising future research avenues. The main contribution of this chapter is to provide a summary of extant research of KM in SMEs.

Defining SMEs

The purpose of the following sections is to define SMEs and, based on this definition, to develop our understanding of these firms' particular characteristics. This is done using quantitative and qualitative methods.

Quantitative Features

A crucial factor in identifying the quantitative importance of SMEs is the question of how to define this group of enterprises. This has resulted in

numerous definitions, two of which (a German definition and a European definition) are depicted in Tables 20.1 and 20.2.

Table 20.1 shows that, according to the Institut für Mittelstandsforschung in Bonn (Germany), the definition of SMEs includes all companies with fewer than 500 employees and with a maximum turnover of €50 million.

On the other hand, the European Commission proposes the definition as shown in Table 20.2.

The European Commission further states that a small company should be to a large extent independent. This means that another company must not possess a share of more than 25% in the company concerned.

A comparison of the data shows a substantial difference between the two definitions regarding the category 'employees'. In the case of Germany, Kayser (2006), for example, advises against applying the European Commission's definition due to different average company sizes found among German SMEs. He explains, for instance, that the average company size of an industrial SME is five times greater than that of one found in the craft sector.

Using the criterion 'employees' might be a pragmatic choice as it is easy both to determine in practice and to compare. Furthermore, as the criterion is quantitative, it is regarded as 'objective'. Difficulties in measurement, however, can be generated because of a mix of different kinds of labour, for example, full-time, part-time and voluntary (Curran and Blackburn 2001). In addition, employment measures are rather sector dependent, reflecting the heterogeneity found in SMEs.

The criterion 'turnover', which is used in both definitions, reveals similar problems. Again, sector differences have to be considered (e.g., a small retailer with a turnover of €100,000 p.a. compared with a small manufacturer selling

Table 20.1 Definition of SMEs according to the Institut für Mittelstandsforschung

Enterprise size	Number of employees	and	Annual turnover (euros)
Micro	Max. 9		Max. 2 million
Small	10–49		Max. 10 million
Medium	50–499		Max. 50 million
All SMEs	Max. 499		Max. 50 million

Table 20.2 Definition of SMEs according to the European Commission (2005)

Company category	Employees	Turnover (euros)	or	Balance sheet (euros)
Micro	Under 10	Max. 2 million		Max. 2 million
Small	10–49	Max. 10 million		Max. 10 million
Medium	50–249	Max. 50 million		Max. 43 million

worldwide with a turnover of €2,000,000 p.a.). But the main challenge is to determine the small firms' turnover, as they often have fewer requirements regarding the disclosure of financial data. Because of this, different financial practices exist among small firm owners which complicate a comparison (Curran and Blackburn 2001).

The lack of an international uniform definition, on a quantitative level, of SMEs makes comparisons across countries very difficult (Green and Mole 2006).

Qualitative Features

The size of a company usually has a quantitative connotation, but qualitative criteria ought not to be excluded when trying to define SMEs. Pfohl (2006), for example, warns that using only quantitative aspects to distinguish SMEs would leave a variety of affected companies out of consideration. According to this author, qualitative aspects are more suitable for the distinction of SMEs.

The literature shows that for the qualitative characteristics many proposals can be found as well. The Institut für Mittelstandsforschung applies the following qualitative factors:

- unity of ownership and personal responsibility for the enterprise's activities;
- unity of ownership and personal liability for the entrepreneur's and the enterprise's financial situation;
- existence of a flat hierarchy and of consensus between employer and employees;
- local relationships; focus on market and customer;
- personal relationship between enterprise and environment (Günterberg and Kayser 2004).

According to Mugler (1998), there are some characteristics that are typical of family businesses and manufacturing firms:

- The firm is shaped by the personality of the entrepreneur, who is the manager and very often the owner of the company as well.
- The entrepreneur disposes of a network of personal contacts with customers, suppliers and other relevant stakeholders.
- The firm produces customized products and services.

- The exchange between management and staff is close and informal.
- The firm's organization is less formal.
- The firm can react quickly to changes in its environment.

Additionally, the following aspects can be named:

- Small firms have a relatively small market share.
- Their owners manage the firms in a personalized way and not through other means, for example, an external chief executive officer (CEO).
- Small firms are independent in the sense that they are not part of larger firms and the owners are relatively free from external control in making their managerial decisions.
- The aspiration for private motives, for example, independence, can be observed within the framework of the owners' business activities.
- It is not uncommon that the processes of business planning and decision making are limited to only one person.
- Many smaller firms face resource constraints in view of assets such as financial capital, labour, machines and so forth (AWH 2004; Culkin and Smith 2000; Curran and Blackburn 2001; Jarillo 1989).

However, it should be stressed that the more detailed the proposals, the greater the danger that they will match only a small subgroup of all small firms.

In sum, it can be concluded that all qualitative definitions presented above punctuate the close relationship between owner and company. Furthermore, the aspect of independence appears to be essential.

KM in SMEs

Knowledge has become the most important strategic factor of business operations (Spender 1996), as it is associated with firms' capabilities to achieve a competitive advantage (Teece 2001). Accordingly, companies should find ways to adequately manage this element, a particular challenge for SMEs as they usually lack the resources and structures needed to make full use of their knowledge base. While KM has been studied extensively, there is still a tendency to focus on large businesses (Durst and Edvardsson 2012; Massaro et al. 2016). Against the background of SMEs' significance to many countries, this approach can be assessed as unsatisfactory.

Nevertheless, in recent years some empirical studies of KM in SMEs have been conducted, and the aim of the following sections is to provide some insights into these studies' findings.

In this chapter, KM is viewed as the processes and structures developed and maintained by SMEs to support different knowledge processes, such as creation, transfer and retention.

The studies available on KM practice in SMEs have proposed that such firms are less advanced when dealing with this factor (Wong and Aspinwall 2005). Furthermore, they were found to be 'having a more mechanistic approach to knowledge construction and relying less on social interaction' compared with large businesses (McAdam and Reid 2001, p. 240). The case study of Beijerse (2000), which comprised 12 Dutch companies (ten of which were SMEs), showed that not a single company had a KM strategy in place. On the other hand, it appeared that the companies used a variety of instruments to evaluate, acquire, develop and share knowledge. Yet these tools are often not considered as instruments for KM. A similar result was obtained in the study conducted by Desouza and Awazu (2006), who further found that the SMEs in their study tended to put the knowledge generated immediately into practice instead of storing it. Moreover, their study showed that smaller firms are less susceptible to the loss of knowledge if it does not reside in the brain of only one employee. Nunes et al. (2006) conducted a study targeted to obtain data about the KM awareness, perceptions and requirements of SMEs. The results showed that these companies do not see KM as a crucial function. Nevertheless, guidelines and other procedures established to deal with KM issues have been observed. As a means to reduce the danger of knowledge concentration among a few organization members, Massa and Testa (2009) showed the benefits of having an e-procurement system for knowledge codification and storage. Hutchinson and Quintas (2008) found that certain processes and means are present within SMEs indicating that they do understand KM, but that it mostly happens in an informal way. In the few firms that had a formal KM process, it was found that the interviewees themselves used the term KM to describe their activities. Based on these insights, the authors concluded that the concept and vocabulary of KM are increasingly being acknowledged and applied in SMEs.

Regarding knowledge identification, the paper by Durst and Wilhelm (2011) provides insights into the practices of a German medium-sized company. The paper addresses the relevant issue of making a distinction between specific knowledge which is difficult to imitate or rare within the firm and knowledge that is easily accessible or reproducible. In a later paper, Durst and Wilhelm (2012) show the influence of a precarious financial

situation on activities related to KM and succession planning. Although the organization members were aware of obvious needs for improvement within the firm, their actual scope of action was centred on the execution of current orders. Coyte et al. (2012) investigated the processes used to control the management of knowledge resources in SMEs in order to compare the findings with the underlying assumptions and prescriptions of intellectual capital guidelines designed for SMEs. Among the findings was that despite the absence of a formally documented and labelled KM strategy, the management of knowledge resources in the companies involved was partly governed by an explicit but informally managed organizational strategy.

Regarding different KM practices, Wee and Chua (2013) showed in their study of four Singaporean SMEs that knowledge creation in those firms is oriented to offer customized solutions to meet customers' needs, whereas knowledge sharing occurs through cross-functionality and overlapping roles, and is facilitated by close physical proximity in open workspaces. Knowledge reuse, on the other hand, is often done tacitly, which means that knowledge is prevalently embedded within the KM processes of SMEs.

Durst et al. (2013) studied which knowledge creation activities are undertaken in small German companies operating in the construction industry. The findings demonstrate the influence of external knowledge sources on knowledge creation activities. These sources, which can be customers, suppliers, business partners, associations and befriended companies, are used for different objectives, for example problem-solving or getting access to new information, and thus help the smaller firms to expand their knowledge base beyond company boundaries. These knowledge sources are located in close proximity to the firms, highlighting the dynamics of the construction industry in Germany, which is driven by smaller locally or regionally oriented firms. The study also indicated that even though managing directors take advantage of different external knowledge sources, they seem to put an emphasis on informed knowledge sources.

Yee-Loong Chong et al. (2014) showed the impact of KM (i.e., knowledge acquisition and knowledge application in particular) on the adoption of e-business for supply chains in Malaysian SMEs. Zieba et al. (2016), in their study involving 12 owners and managers of small companies belonging to the knowledge-intensive business services (KIBS) sector, found that these had no formal KM plans, despite the fact that the examined companies had all introduced various KM practices. The authors labelled this an 'emergent KM approach'. They identified an orientation towards day-to-day problems and knowledge needs, a bottom-up approach to problem-solving, the need for flexibility and the difficulty of investing in resources exclusively devoted to KM as possible explanations.

The main findings of the current research are summarized in Table 20.3.

Table 20.3 Summary of current research on KM in SMEs

Status quo of study of KM in SMEs
The research is rather fragmented and driven by a small number of researchers.
There is still a tendency to adopt a 'large firm' mindset when studying KM in SMEs.
Western countries still dominate the field of research.
The knowledge processes of main interest are knowledge creation/acquisition, knowledge application and knowledge transfer.

Why KM in SMEs?

As has been shown, KM is practised in SMEs, yet some practitioners still may ask why they should manage their knowledge. This issue will be discussed in this section in more detail.

We have shown that smaller firms often face resource constraints, which means that extant resources should be used with special care, as erroneous decisions will have more serious complications than they will have in large businesses (Amelingmeyer and Amelingmeyer 2005). On the other hand, the knowledge of SMEs may be viewed as an unlimited resource, and, according to Desouza and Awazu (2006, p. 33), 'the only way an SME can limit this resource is by not using it effectively'.

The general need for a systematic approach to KM can be seen in a variety of situations. A classic example in SMEs is the issue of company succession or business transfer. Succession is an event that sooner or later confronts all businesses regardless of their size (Dyck et al. 2002). Therefore, succession planning is viewed as vital to avoid 'falling into a hole'. According to Sambrook (2005, p. 580), succession planning refers to the 'attempt to plan for the right number and quality of managers and key-skilled employees to cover retirements, death, serious illness or promotion, and any new positions which may be created in future organisation plans'. Activities such as selection, development and training of the successor, as well as activities by the predecessor such as documentation and induction of the successor, can be named in this context.

In the case of succession, the transfer of knowledge represents a critical aspect in a company's continuity (Cabrera-Suárez et al. 2001), as the knowledge of the incumbent and some key employees may be the source of the firm's competitive advantage (Barney 1991). Indeed, the departure of any one of them could result in a lack of know-how that is essential for company success. As a smaller company is usually not able to replace departing employees in the short term (Hall 1993), if at all, this, in turn, means that the stock of human capital and relational capital of such a firm will be at risk (Jääskeläinen 2007).

The transfer of the incumbent's knowledge in particular is seen to be of great relevance (Cabrera-Suárez et al. 2001). This is confirmed by a Finnish study on SME family business succession conducted by the Ministry of Trade and Industry in 2001. The study revealed that the transfer of knowledge is regarded as the third most important element for family business succession, after finding a successor and taxation issues (Malinen 2004).

Consequently, SME management should be aware of the importance of the process of knowledge transfer to prevent a lack of key knowledge disappearing after the individual concerned has left the firm. It can be observed that it is common practice that the successors are required to learn everything from the beginning (Wong and Aspinwall 2004). As a result, valuable time for more important activities is lost. Additionally, company practice shows that the implications of exit are often underestimated (Kransdorff 1996). As a result, the effects of knowledge attrition only become perceptible when an organization member has already left the company (Lynn 1998).

The fact that the relevant knowledge of many smaller firms is stored in people's minds, specifically in that of the owner, increases the danger that the company will be at risk without him/her present (Wong and Aspinwall 2004). This clarifies the importance of the codification of individual knowledge to create structural capital that can be owned by the firm (Subramaniam and Youndt 2005). However, it must be stressed that just because some knowledge is stored does not necessarily mean it will be found or used in the right way. On the other hand, these storage activities are less helpful in the context of relational capital, which is often personal (Massingham 2008), as well as when talking about knowledge of a different quality (i.e., tacit versus explicit knowledge). Consequently, only a small portion of the entire knowledge a critical organization member possesses is captured (Parise et al. 2006). However, this should not prevent smaller firms from initiating measures aimed at knowledge retention. For example, in order to retain the knowledge of departing experts, a small software firm has developed and implemented an 'expert' system intended to capture and describe the competencies of its employees (CEN 2004).

KM can help make smaller firms less exposed to internal and external disruptions. As we have seen, some studies have suggested that a systematic approach to KM is found less often in smaller firms. Thus, measures to deal with knowledge are mainly used sporadically. In addition, the fact that knowledge is seldom stored or shared with other organization members makes those firms and their owners, as Shelton (2001, p. 431) puts it, 'at the mercy of their own health or the career decisions of their staff'. KM could help reduce this vulnerability.

Finally, as has been shown, it is important to refrain from viewing knowledge primarily as something positive, as something of value (Brunold and Durst 2012; Durst 2012).

Benefits of KM in SMEs?

The presentation of best practices can be very helpful in convincing people to participate in KM. The studies discussed previously primarily illustrated how KM is conducted in SMEs. Thus, in the following, the focus will be on showing the outcomes and outputs of these KM activities. A recent review by Edvardsson and Durst (2013) identified many benefits of KM in SMEs, including increased organizational success, growth in sales, fewer losses, increased productivity and process improvements as a consequence of the smaller firms' KM activities (e.g., Edvardsson 2006, 2009; Salojärvi et al. 2005). Some scholars (e.g., Migdadi 2009; Wei et al. 2011) have stressed that KM activities contribute to employee development (e.g., skills increase, learning, staff retention) and improved customer satisfaction (e.g., customer loyalty, reputation, etc.) (e.g., Edvardsson 2006, 2009; Steenkamp and Kashyap 2010; Wei et al. 2011). Similarly, other scholars point to improved innovation, creativity and knowledge creation (e.g., Soon and Zainol 2011; Wei et al. 2011), and improved external relationships with other firms (Capó-Vicedo et al. 2011; Migdadi 2009). Liao (2011) found that there was a close strategic fit between KM practice and human resource management policy with respect to organizational performance. In sum, the focus of much of this literature suggests that KM contributes to SMEs business operations.

How Can KM Be Applied in SMEs?

The Need for KM Strategies and Measures

The individual knowledge of organization members is private, and thus a smaller firm must establish appropriate measures in order to benefit from it (Trevinyo-Rodríguez and Tàpies, 2006), for example document repositories, knowledge sharing forums and storytelling. Yet every small company should begin with the formulation of a suitable KM strategy, as this will help the company manage the accumulation of knowledge more effectively. In determining 'what to do' with their knowledge, KM strategies are used to help companies reach certain objectives. KM strategies address the 'how to'

question as well (Asoh et al. 2003). For example, a medium-sized German company operating in the printing sector developed a knowledge strategy to obtain a better understanding of the knowledge residing in the organization and thus any knowledge gaps. In order to reach this aim, a knowledge map was developed and a tool was applied to identify critical knowledge within the company (Durst and Wilhelm 2011; Durst and Wilhelm 2013).

Given the specific idiosyncrasies of SMEs, one would assume that KM strategies (strategies in general) are useful to make the most of the constraints and opportunities of the present and future business environments. The empirical findings presented earlier also indicate a great need for improvements in this area.

The Role of the Owner/Owner-Manager

The centrality of the owner/owner-manager, particularly in smaller SMEs, also means that these people are responsible for recognizing the benefits of KM to support the firm's operations. However, SMEs' day-to-day business operations require close attention (Hofer and Charan 1984). This very often results in situations where insufficient time is available for strategic issues. This in conjunction with a lack of financial resources and expertise (Bridge et al. 2003) frequently results in most knowledge being kept in the minds of the owner and some key employees rather than physically stored or shared through substitution arrangements, for example by having a deputy in place (Wong and Aspinwall 2004).

KM May Take Place at Any Time in the Organization

As has been shown, knowledge sharing in smaller firms occurs through cross-functionality and overlapping roles and in environments characterized by close physical proximity (Wee and Chua 2013). It may occur in corridor conversations (Wong and Aspinwall 2004) or even at organization members' birthday parties (Durst and Wilhelm 2012).

Think Broadly When Applying KM

KM activities, however, should not be limited to knowledge creation and knowledge transfer but should involve knowledge retention as well. Knowledge retention is about 'maintaining, not losing, the knowledge that exists in the

minds of people (tacit, not easily documented) and knowing (experiential action manifesting in behavior) that is vital to the organization's overall functioning' (Martins and Meyer 2012, p. 80). In comparison with other KM practices, knowledge retention takes place within a limited period of time and addresses the challenge of transforming an 'expert´s most valuable knowledge' into an organizational asset (Levy 2011, p. 583). Given the quality of different forms of knowledge, the main challenge for any knowledge retention activity will be to find a proper trade-off between losing and retaining knowledge, which in turn underlines once more the need to have proper knowledge strategies in place. Consequently, the retention activities should be built around the planned KM strategies to ensure the efficient use and reuse of knowledge in the long term. The fact that SMEs are said to be good at networking (O´Donnell 2014) represents a sound basis for concrete steps towards the continuous use of knowledge. During daily meetings, the managing director could highlight the benefits of knowledge retention for every single employee and the firm as a whole. Moreover, CEOs should also consider the benefits of external knowledge retention, that is, retaining and maintaining knowledge externally for the company (Miller et al. 2011). As smaller firms are taking advantage of a number of different external knowledge sources, as outlined previously, the realization of this measure should be easy.

Measuring the Success of KM

To increase the acceptance of KM activities, smaller firms should introduce performance indicators to show the benefit of the KM activities that have been undertaken. Lee and Wong (2015), for example, have developed a KM performance measurement model for SMEs in order to support the firms with this crucial task. This model covers the critical elements of KM based on three aspects, namely: knowledge resources; KM processes such as knowledge acquisition, knowledge application and utilization, and knowledge codification and storing; and KM factors such as culture, management leadership and support.

Knowledge Can Be Both an Asset and a Liability

KM that involves risk management as well can help smaller firms better understand the knowledge and its quality. Knowledge should be approached from a neutral point of view, that is, as something valuable—an asset—in some situations, and something risky—a liability—in others (Brunold and

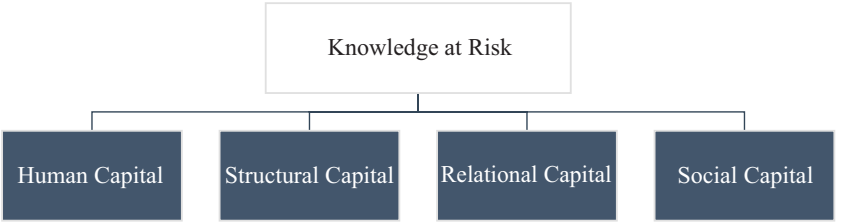

Fig. 20.1 'Knowledge at risk' dimensions

Durst 2012). To address this issue, some tools have been developed specifically for SMEs. Durst and Wilhelm (2013) have developed the Knowledge at Risk Score. This instrument was specifically developed for SMEs facing the danger of knowledge attrition due to voluntary and involuntary turnover. The aim of the tool is to provide insights into the concentration of relevant knowledge with certain individuals in certain departments. A composite measure was created to calculate an overall 'knowledge at risk' scale. This scale represents the sum of four values dimensions: human capital, structural capital, relational capital and social capital (Fig. 20.1).

The tool not only assists managers in understanding which organization members are key players in the firm, but also helps them to evaluate what criteria make those organizational members' knowledge important and critical in terms of managing knowledge stocks and flows. The latter is especially beneficial, as it provides more concrete information about the type of knowledge available within a firm, and thus the tool's results help to make knowledge visible. This improved understanding can enable SME managers to establish measures intended to retain the organization member concerned and their knowledge as long as possible or to prepare his/her replacement before a crisis can arise. In addition, the outcome also provides a better understanding of areas of knowledge concentration and indicates areas of dependency, particularly if this dependency is centred on only one or just a few organization members.

The Role of Knowledge Risk Management

Regarding the risk management of knowledge, Durst and Aisenberg Ferenhof (2016) have developed a framework for Knowledge Risk Management in SMEs. This framework is based on the classic risk management subprocesses (risk identification, qualitative and quantitative analysis, management and control, and continued reporting) surrounded by three areas of knowledge risks (i.e., knowledge loss, leakage and waste). The framework can help SMEs to

better understand and manage their critical knowledge; for example, they can introduce measures to retain and protect this knowledge in a timely manner.

Conclusion

In a knowledge-driven economy that is characterized by increasingly rapid changes, the effective management of knowledge has become ever more significant. This applies to all categories of firms, and SMEs in particular. The smaller the company, the more likely it is that the founders or managers are absorbed in the day-to-day business operations, which in turn prevents them from addressing this challenge.

This chapter aimed to address KM in SMEs by covering a number of different KM criteria required to understand this topic in more detail. More precisely, the chapter covered the aspects of SME definition, the practices of KM, its benefits and how it should be approached in order to increase the contribution of KM practices to the company's overall operations.

The chapter has shown that the study of KM in SMEs has been developing in recent years. Given the importance of SMEs for the prosperity of countries, however, these activities have not been satisfactory. This has recently prompted scholars to call for more intensive research (e.g., Durst and Edvardsson 2012) that will enable greater understanding of the link between KM and SME application.

Following Durst and Edvardsson, the authors of this chapter agree on the four broad themes that would help develop our understanding of KM in SMEs. These themes are presented in Table 20.4.

In addition, the authors of this chapter suggest the study of unlearning. As the process of KM, and knowledge creation/acquisition in particular, is closely linked to learning, which often means the learning of new things, individuals must be prepared and willing to unlearn in order to establish the needed know-how and mindset(s) required for understanding and applying the new knowledge. The means SMEs use to foster and initiate unlearning might be a useful field of intense research. Here country comparisons would be suitable as well.

Against the backdrop of the resource constraints to which many smaller firms are exposed, they need to intensify the identification and usage of external knowledge sources. Future research could address questions such as how SMEs proceed in this context, or how they identify suitable external knowledge sources, in order to develop our body of knowledge regarding this specific KM practice.

Finally, as has been mentioned in the chapter, in order to develop a holistic understanding of KM, future research should pay more attention to the study

Table 20.4 Future research themes

Research theme	Description of theme
Longitudinal studies	Considering the long-term focus of KM, there is a need for research designs that follow a longitudinal approach. Cross-sectional studies are not able to capture specifically the development and success of KM practices over time. This insight is required for developing a better understanding of what is working and what is not working in different situations and contexts.
Country comparison	As addressed above, the contextual issue needs to be taken into account. An interesting aspect of context would be to study the impact of the cultural context on KM practices in SMEs, as it is natural to assume that KM practices will vary from country to country as highlighted in the studies presented. Therefore, cross-country studies would help in detecting differences and the reasons behind these differences.
Mixed methods approaches	The complexity of KM should be reflected in the research methods as well. Consequently, researchers are urged to take advantage of a variety of research methods to come closer to this complexity.
Realistic lens	Any future research should be based on the fact that SMEs are not comparable with large companies. Consequently, research should not adopt a large firm perspective when studying KM in SMEs, but instead take an approach that acknowledges the specific attributes of SMEs and hence the specific challenges these firms are facing. In all these studies the issue of heterogeneity needs to be considered as, for example, KM practices in very small companies cannot be compared with those found in medium-sized ones. Researchers need to design their research projects accordingly. The same applies to different industries, which also show size variations and differences in their managerial approaches.

of knowledge risks, as only then will it be possible to understand the actual impact of knowledge on the company and its operations, and by this support the development and implementation of measures that respond to the specific requirements of the small company in question.

In sum, the present chapter provides an in-depth introduction to KM in SMEs that covers relevant issues for understanding this critical research field of KM.

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21

Knowledge Management in the Public Sector

Hank Malik and Suleiman Al-Toubi

Introduction

This chapter focuses on a review of the current status of KM in the public sector from the practitioner's viewpoint and, with the aid of practical examples, covers the following areas:

- The current challenges in the public sector—and how KM can address opportunities to support, for example, doing more with less, demonstrating more cost effectiveness in operations and delivery through a combination of people, processes and technology enablers.
- The status of KM in the public sector and the knowledge-based economy—a set of broader observations and personal views from the KM practitioner's side with examples of best practices that have been achieved. Consideration will be given to the aspirations and potential impact of KM.
- Recommendations for implementing KM in the public sector—with a structured set of proven best practices from multiple engagements by practitioners. It should be noted that these practical guidelines should be of equal value to the private sector when considering the introduction of a KM programme or re-energising a current one.

H. Malik • S. Al-Toubi (✉)
Petroleum Development Oman (PDO), Muscat, Sultanate of Oman

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The Current Challenges in the Public Sector and How KM Can Help

At the public sector and government level, KM could be defined as leveraging knowledge for improving internal processes, for the formulation of sound government policies and programmes and for efficient public service delivery for increased productivity (Misra 2007). KM has been present in the public sector and in government for over 20 years, with mixed results achieved to date. However, the knowledge and information challenges facing the public and government sectors are as critical as they have ever been, if not more so, with the ever increasing need to deliver better customer services and experiences, more demand on financial accountability and stretched annual budgets. Thus there is pressure to deliver more with less, and this should allow KM to develop again.

These challenges are further exacerbated by the need for more information transparency and improved security of records and document management. The current challenge of declining oil prices has forced public sector organisations within the Organisation for Economic Co-operation and Development (OECD) countries in particular to develop more knowledge-based initiatives and to become effective organisationally (Biygautane and Al-Yahya 2013a, b, c).

Taking a fresh look at how the full scope of KM, with a structured and more holistic approach, can help address public sector challenges, it should be encouraging to in-house KM programmes and practitioners that a lot of positive interventions can be made and lessons learned from past attempts.

The following section presents a range of highlighted public sector challenges and opportunities for performance improvements where KM enablers can provide support. It is also worth noting that these challenges and supporting KM enablers are also applicable to KM programmes in the private sector.

The following considerations are worth noting. The term 'KM enablers' or solutions refers to a broad set of themes including those based on people, process, content and technology, and we should always keep as holistic a view as possible. For more details on real-life applications of these themes, please refer to Chap. 18, 'KM and Organisational Performance with a Case Study from PDO'. Technology solutions have always been aligned with KM, but when focusing purely on information technology (IT), which in the context of KM is concerned primarily with information, content, document and records management, a large number of programmes have failed to deliver. The richness of a blend of other broader areas such as people, cultural change, learning and process methods is equally important for success, as will be discussed.

Public Sector Challenge: Decision and Delivery Making

There is a significant need in the public sector to deliver better value for money in services with improved and more effective delivery. In addition, the public sector needs to be more agile to respond to customers' requirements and to reduce the response time to key issues and critical demands. However, within local government, delivering more cost-effective services that make better use of the available knowledge, information and data is a challenge (Schutte and Barkhuizen 2013).

With increasing pressure to deliver more with less, the public sector needs to introduce more innovative and effective solutions and reduce decision-making time and the level of bureaucracy. When the World Bank first implemented its KM solution, the culture had a top-down, centralised organisational structure, which hindered the effectiveness of knowledge sharing and ability to deliver (Welton 2015).

KM Value Opportunity By enabling faster access to the right expertise and skills more effectively, KM can help foster better-informed decision making, leading to actions being taken more quickly and improving overall responsiveness. The people or skills profile, or the Yellow Pages, is a common feature on most organisations' intranets, but a focused effort to engage with staff is needed for the full benefits to be realised. This is where the change management skills of the professional knowledge manager can come into play, encouraging its usage and helping to connect decision makers and experts more quickly.

In addition, by facilitating lessons-learned activities, the public sector can save money and time by not making the same mistakes, and improved sharing between departments can help delivery bodies to be better aligned. For example, KHDA, a Dubai Government entity, implemented a KM programme to improve policy-making and internal decision making (Biygautane and Al-Yahya 2013a, b, c).

Public Sector Challenge: Better Cost Savings and Quality Improvements

The public sector is increasingly coming under pressure to reduce costs, and combined with the introduction of more performance-related targets, continuous improvements are needed to meet demands to deliver more with less.

Staff needs to demonstrate more responsiveness and increased productivity, and to multitask and achieve performance targets more effectively.

KM Value Opportunity KM can assist by helping to create the right behaviours and culture to capture performance ideas with focused methods which may not require IT. These could include knowledge cafes, after-action reviews and knowledge marketplaces. By bringing staff together and developing a more supportive culture, new ideas can be generated and shared to deliver more cost-effective services and prevent wasted expenditure. For example, the Dubai Courts in Dubai introduced KM with one aim being to increase productivity and quality of service (Biygautane and Al-Yahya 2013a, b, c).

More cost-effective and flexible collaborative IT solutions could be considered to deliver solutions, including 'cloud based' pay as you go options. The need for long and costly in-house developments should be reconsidered against 'off the shelf' cloud solutions with minimal configuration. From a business custodian perspective, KM, not IT, should advise and own the collaborative and new social workplace space, review the options and steer the strategy and future direction. In effect, KM can help to streamline and 'lean' IT solutions.

Public Sector Challenge: Adopting the Required Culture and Behaviours

With increasing pressure to achieve challenging performance targets in the public sector with reduced supporting resources, the morale and overall supporting culture can become more constrained and uninspiring. This, alongside the departure of an experienced, maturing workforce and a perceived lack of incentives to share individual knowledge, has led to a more siloed approach to working with reduced learning and knowledge sharing across departments. Local government can sometimes practise insufficient knowledge sharing with central government and can promote siloed behaviours (Schutte and Barkhuizen 2013).

Another observation is that public sector and government departments traditionally work on an autonomous basis and do not have any incentive to better communicate or collaborate with one another for cost efficiencies. These cultural barriers will be hard to change (Warlock 2002).

KM Value Opportunity Through learnings captured from multiple KM engagements, a range of knowledge transfer methods could be introduced to encourage a more supportive learning and knowledge sharing culture.

These would require participants to communicate openly and share their experiences and could include areas such as lessons learned, peer assists, knowledge harvesting and storytelling, and anecdotal enquiry. These methods should all be part of the KM practitioner's 'toolkit' and could support a broader change management programme. Incentives should be introduced to encourage knowledge sharing, but not necessarily financial ones. Earlier research has proven that for KM, peer-to-peer recognition and appreciation for valuable knowledge shared is far more effective than a nominal monetary offer. KM can provide significant support for the global transition needed in the Middle East to a knowledge economy through organisational excellence and behavioural changes (Arab Knowledge Report 2009).

Introducing new internal social workplace tools such as Yammer, Huddle and Facebook in the workplace will demonstrate a move towards a more modern work environment. This coupled with flexible working conditions should encourage more collaborative behaviours and a social working culture. It should also make working in the public sector a more attractive proposition for millennials and the younger workforce now entering the job market. A full range of practical and cost-effective KM methods and tools such as 'lunch and learn' and communication aids can help promote behavioural changes (Serrat 2010), all of which can help build the 'learning organisation'.

Public Sector Challenge: Loss of Critical Expertise and Know-How

As is common in the Western world and developed economies, there is continuing loss of critical skills and expertise which is exacerbated by a rapidly maturing workforce, as the majority of 'baby boomers' begin to retire. Within the public sector there is a need to identify and capture these skills and key lessons learned more efficiently with knowledge transfer of departing staff. However, a key challenge for most organisations is to identify where key expertise resides, and to determine how to access it quickly before they depart—that is, how to ask the right questions of the right staff? Again using the example of the oil-dependent countries of the Gulf Cooperation Council (GCC), they face a particular challenge with the departure of experienced technical expertise and skills with job cuts. This 'rented knowledge' is then lost to the organisation due to poorly structured or nonexistent KM solutions (Biygautane and Al-Yahya 2013a, b, c).

KM Value Opportunity In order to assist with this challenge, KM should offer a range of knowledge and skills-based mapping techniques to identify key expertise areas and then focus on prioritising needs. A common approach which could fall under the KM umbrella is social networks analysis (SNA), which has been available for a number of years. This can demonstrate extra added value to the knowledge manager and also should be aligned closely with the human resources (HR) department for succession planning and training needs analysis. By undertaking such an exercise, the organisation should become better prepared to manage the gap created by critical knowledge departure.

The importance of better managing an organisation's expertise and talent was recognised by the World Bank, with a focus on building external networks to provide policy advice with improved global linkages (Welton 2015). The skills, expertise and knowledge of the public sector workforce is an important central resource which should be protected as a key asset. There should be a clear knowledge retention process put in place to preserve the 'institutional' memory of departing staff and pass it on to new staff (Cong and Pandya 2003).

In addition, KM can play a more dominant role in the off-boarding process, which appears to be handled very poorly in both the public and private sectors. The KM discipline can introduce the concept of structured knowledge-retention interviews, that is, asking probing and reflective questions of selected departing staff, to ensure that key 'knowledge nuggets' are captured. Furthermore, as mentioned above, by implementing a well-managed people skills finder with a solid enterprise search capability, it will be easier to identify, capture and nurture critical skills in good time before key staff leave.

Public Sector Challenge: Better Management of Content and Information

Within the public sector there is increasing legislation for improved compliance with document, records and information management (IM) guidelines and standards, which is adding increased work demands to IT departments. In addition, increased information management risk and security measures are needed to safeguard information and data. On the other hand, there is pressure for access to records and data for e-discovery together with acts such as the Freedom of Information Act.

KM Value Opportunity A structured approach to KM should include closer integration with the information management section of the IT department, through an integrated KM operation model. The KM department should take a broader view of 'explicit' knowledge content sources and ensure they comply with its IM standards. KM should focus on better management of unstructured content, blending both more tacit and explicit knowledge sources, and give them the same level of protection as more formal records and document management. This means complying with a standard approach to information classification, categorisation, meta data tagging and document versioning. However, care should be taken that KM initiatives do not focus solely on IT, as the KM vision can only be delivered with personnel buy-in (Welton 2015).

Additional benefits would be derived from ensuring that KM is an integral part of the organisation's enterprise content management architecture for unstructured data. At the Road and Transport Authority (RTA), Dubai, fresh knowledge was classified, indexed and stored with the support of electronic data management systems (EDMS) together with the intranet portal (Biygautane and Al-Yahya 2013a, b, c). Supported by an enterprise approach to search, KM should also focus more on content ownership and authorship, thereby allowing organisations to have quicker access to the right content at the right time, in the right context.

UK electronic (e-government) initiatives to better serve clients led to a major rethink of how the services and supporting information produced can be better utilised to meet the needs of both citizens and businesses (Warlock 2002). This helped to raise the profile of KM in the UK with a more strategic approach that began at senior levels in central government.

Public Sector Challenge: Learnings Not Reused Across Departments

In public sector organisations where there has been little or no effort to implement KM, and where there is insufficient emphasis on the importance of delivering proper lessons learned and knowledge transfer, it is not surprising to see the same mistakes repeated. This can be a very costly exercise in terms of time, resources, people and health and safety. Lessons learned and best practices are not openly communicated and shared, leading to a large amount of organisational ignorance, duplication of efforts and wasted public funding expenditure.

KM Value Opportunity The KM department should introduce or re-energise a dedicated effort to deliver a robust lessons learned and best practices programme. Adopting a best practice approach, the KM team should actively lead and deliver such knowledge-capture events and act very much as hands-on knowledge facilitators and 'learning' catalysts. In addition, events such as lessons learned, peer assist, knowledge harvesting and knowledge cafes can be delivered very cost effectively and don't require expensive IT involvement. Lessons learned, best practice capture and peer assist have facilitated well-publicised successful achievements by British Petroleum (Collison and Parcell 2012).

By creating a supportive environment for sharing lessons learned and best practices, KM can help to quantify the real value achieved by cost savings or cost avoidance to bring about significant performance improvements. The outputs of key lessons and best practices can be published as quick 'snap shots' or learning knowledge cards for broader communication and ideally be integrated into the organisation's e-learning and training curriculum for 'just in time' or 'any time' learning, most probably through the corporate intranet. Another objective of running the KM programme in Dubai Police (DP), Dubai was to help improve the creation, transfer and knowledge sharing both internally and externally between DP and the wider Dubai Government (Biygautane and Al-Yahya 2013a, b, c).

Public Sector Challenge: Poor Collaboration and Poorly Performing Communities

Across the public sector and government, research has found that on the whole there is poor collaboration and networking not only across departments but internally within functions and between teams. Within local government, an additional challenge is for more responsiveness to customers at the community level, with more social identity needed (Schutte and Barkhuizen 2013).

A combination of 'not-invented-here' syndrome and a lack of incentives or willingness to share has led to quite a siloed work mentality. It was found that staff feel reluctant to either ask questions on internal open discussion forums or share insights and experiences outside their immediate team or department. Communities tend to be informal and the outputs are not readily shared. This leads to a lot of duplication of effort, lessons not shared and operational advantages not being exploited.

KM Value Opportunity KM can help to promote and catalyse a more dynamic and open collaborative culture with a blend of people, content, process and technology. Key to this is to encourage the organic growth of communities, networks and forums to help public sector organisations become more agile. Using the proven communities of practice methods can improve peer-to peer-networking, supported by easy-to-use community tools such as a SharePoint. Good user design is critical for buy-in. By introducing targeted communities, organisations can improve knowledge sharing and more efficient cross-work, and allow for expertise to be communicated and insights shared more effectively. The World Bank realised the importance of communities of practice and achieved success with an educational sector to encourage innovation and entrepreneurialism (Carayannis and Laporte 2002). By supporting communities and collaboration through good KM, the aims of providing local communities with improved social networking and social identity can be developed (Schutte and Barkhuizen 2013).

The Status of Knowledge Management Within the Public Sector

Although KM has existed as a learning and performance improvement solution for over 18 years, research suggests that its impact in the public and government sectors has been limited to date, with some notable exceptions. The promises that were made during the late 1990s for the role of KM in a strategic sense should today be playing a more dominant role in the vision of the knowledge-based economy and more transformational e-government. To date, this has not come to fruition. But significant opportunities do exist for KM to regain its former profile and deliver benefits realisations and should be explored. The demand is perhaps greater than ever in the public sector and government in dealing with the challenges created by the new knowledge-based economy, with increasing international competition from organisations offering competing services (Cong and Pandya 2003).

Best practice research in Australia also found that increasing operational demands for closer citizen engagements was driving the need for better KM. Organisations may not use the term KM but are indeed implementing organisational learning to improve delivery.(Australian Government, Information Management Office 2004).

Some evidence from research seems to indicate that the public sector is currently falling behind in fulfilling the earlier promises of KM (Cong and Pandya 2003). Thus there is an opportunity to either restart or introduce KM with a clearer vision around a more collaborative and learning approach using the platform of a more flexible, open, 'social' workplace that needs to be embedded with expertise, skills and learning.

Research points to the role of large IT vendors and management consultancies that promoted early KM (Release 1) in order to sell hardware and services. These initiatives were primarily top-down managed efforts, with the aim of building large central knowledge bases of data and information management—not true knowledge and learnings. This inherently meant the use of extremely expensive and cumbersome document management systems, the majority of which delivered little or no benefits realisation. Central government policy was focused on a command and control approach to information management and document management, which unfortunately saw burgeoning KM practices absorbed into this field.

In fact, first-hand observations were made of wrongly named and costly 'KM' solutions that failed, which in reality should have been called document and information management projects. One of the key reasons for this was that people's working behaviours and concerns were ignored. Demotivated public sector staff were expected to follow regimental document and records management compliance processes that were almost unworkable in the real world. In addition, the large management consultancy and IT services companies in the early 2000s had an interest in selling large, expensive consulting engagements, to push the role of KM as a centrally managed knowledge-based programme, capturing all staff's knowledge in one centrally controlled 'body of knowledge' stored in very expensive IT servers with supporting maintenance contracts.

There appears to be a lack of awareness of the benefits KM can bring to improved performance which has hindered progress (Cong and Pandya 2003). Here the role of communication, change management and training is key to improving the understanding of the value KM can offer. To date, the majority of KM initiatives have been taken on a project-by-project basis as opposed to a more widely sponsored government departmental or countrywide plan. This needs to be rectified with senior decision makers taking responsibility to combine KM with wider e-government policy initiatives (Misra 2007). Cross-public sector and central government learning has occurred in only very limited fields, despite some early valiant attempts in the UK, some of which are discussed in the following section.

Examples of Good KM Practices in the Public and Government Sectors

There have been some notable attempts to deploy a sustainable good practice approach to KM that should be recognised. In addition, the international economic development agencies and banks were exemplary in their efforts to promote KM for the public good. Unfortunately, in a number of cases government funding in the UK and the wider field has since been either withdrawn or reduced, so relatively few new innovative implementations have been identified to date.

NHS/UK The National Health Service (NHS) delivered a very active and focused KM programme and, notable for excellent KM, an NHS e-library which contained a comprehensive knowledge base of all things related to KM, including method toolkits and best practices. This was used by KM practitioners worldwide. In addition, focus was placed on lessons learned, after-action reviews and storytelling to promote knowledge sharing and collaboration between departments (NHS and Department of Health, UK 2007).

Improvement and Development Agency (IDeA) UK The Improvement and Development Agency (IDeA) Knowledge Programme was an initiative which aimed to join up the thinking of more than 2.5 million staff and 21,000 elected members in over 400 local authorities in England and Wales. KM toolkits, guides and aids were produced and made freely available (IDeA Development 2008). The agency was a keen supporter of KM and supported a good range of initiatives and programmes including knowledge transfer process methods and communities of practice. Communities were a particular success supported by IDeA, to help link local councils in the UK. At one stage it was estimated that 26,000 members were connected across 600 communities (Dale 2009).

Department for Environment, Food and Rural Affairs (DEFRA) UK A supportive approach to KM was adopted by the Department for Environment, Food and Rural Affairs (DEFRA), sponsored by the information management department, and the focus was placed on the adoption of SharePoint as the preferred platform. In addition, a strategic approach to information and document management was introduced with KM alignment. Noteworthy were the admirable attempts to bring together central government departments who had an interest in KM and SharePoint in an informal community to share leanings and best practices.

Asian Development Bank (ADB) The Asian Development Bank (ADB) was a keen sponsor of KM to foster economic and social development and had an active KM programme aligned with other institutions to improve knowledge sharing (Serrat 2010).

Asian Productivity Organisation (APO, Tokyo) The Asian Productivity Organisation (APO) was another strong supporter of KM and developed a comprehensive range of solution toolkits to encourage knowledge transfer and learning, some of which are available online (Young 2010).

Swiss Agency for Development and Cooperation The Swiss Agency for Development and Cooperation is a government-sponsored agency that was instrumental in using best practices KM to support economic growth and health in the developing world. A rich and comprehensive set of KM transfer and learning aids were also produced including practitioner toolkits, posters and guiding principles Swiss Agency for Development and Cooperation (2009a).

Indian Government In another proactive example, India has taken the unique initiative among developing economies of setting up a national knowledge commission for leveraging knowledge for economic development (Misra 2007). This has been followed with national recognition for exemplary KM implementations, and the recent introduction of on-site certified knowledge manager (CKM) certification training with the KM Institute (KMI) shows the importance attributed to KM.

KM in the Knowledge-Based Economy

KM has an exciting opportunity to rise again in the public sector and play a crucial role in supporting nations' ambitions to develop and be prepared for the knowledge-based economy. Within the realm of e-government, emphasis should increasingly be placed on the importance and needs of the knowledge worker in the knowledge economy. In the context of the public sector and government, KM should be further defined and positioned as helping to exploit knowledge for improving internal processes, and formulating good government policies to support more efficient public service delivery (Misra 2007).

With public sector budgets currently constrained and with the need to be more competitive, more focus should be placed on managing and combining more effectively human capital assets such as learning, people and intel-

lectual capital (Kelleher and Levene 2001). A renewed aim to develop closer ties between KM and HR departments is advised, with an emphasis on identifying, nurturing and protecting the organisational human capital. The concept of the knowledge economy is not new and it is indeed a global phenomenon, but many still face the challenge of not being able to overcome the barriers to effective knowledge sharing and collaboration (Kelleher and Levene 2001).

Preparation for the knowledge-based economy and delivering on policy can be seen as very high priorities in the Middle East and particularly the GCC, where there is now an urgent demand to become less reliant on 'petro dollars' as a sustained drop in the cost of oil will have long-lasting effects on future economies. These nations and relevant governments need to prepare quickly for the significant changes required to become more knowledge based. They are challenged by both fast-growing and much younger populations (millennials) now looking to join the workforce who need better education and more jobs, and departing experienced staff now retiring or highly technically skilled expatriates being laid off due to energy sector downturns. To address this, the majority of GCC countries are now producing mid- to long-term economic visions focusing on developing and trying to be prepared for the knowledge based-economy.

For example, in the Oman 20/20 vision the emphasis is increasingly on in-country value (ICV), which considers the total spend retained in-country for economic and social development. Of interest to KM is the aim to develop human resource capabilities, reducing dependency on external experts and improving the skills base of Omanis (Strolla and Phaninder 2013).

Knowledge is seen as central to achieving sustainable human capital development in the Arab world and will require the mobilisation of resources and capabilities to build the desired knowledge society. Key to achieving this is creating an 'axis of action' towards building the knowledge society. This will include the transfer and acquisition of knowledge, enabling environments and human development (Arab Report 2010/11). However, a lesson learned of note when considering the introduction of KM is the need to dispel some of the vagueness around the term KM and promote its crucial role in the development and sustainability of organisations. One should focus more on improving collaboration and human interactions, not only on reliance on technology (Biygautane and Al-Yahya 2013a, b, c).

As has been demonstrated, the opportunities for the full breadth of KM to add value to this vision of the knowledge economy is very rich, using the proven strategies, processes, methods, learning and tools. Ambitious and inspirational knowledge managers should embrace these opportunities.

Recommended Implementation Steps for Introducing KM in the Public Sector

This final section offers some practical advice for the KM practitioner, including ten implementation steps to consider when introducing KM or attempting to revive a prior KM programme. These recommendations and directives, although tailored to the public sector, will be equally valid for KM programmes in other sectors and represent a suite of best practices which have been proven to work.

Step 1: Deliver a Maturity Assessment and Business Case

Recommended Activities: The ideal starting point is to undertake a KM maturity assessment to capture the current state of KM in your department or operations and ideally benchmark against best practice, covering the key dimensions of people, process, content and technology. There are numerous variations of KM assessment tools available, and development agencies such as the World Bank have also set up a KM secretariat and produced a knowledge assessment methodology (KAM) to help assess the current state (Misra 2007).

Such an assessment could take the form of a more shortened 'health check approach', and a key outcome of the assessment should be to identify and prioritise areas where KM can make a real difference with a focused effort. The KM audit is needed as an accurate starting point to understand the current state, before undertaking the KM culture change programme (Serrat 2010).

By assessing and prioritising the key challenge in their function or department and mapping potential KM opportunity enablers to them, the KM practitioner can start to create the initial business case for KM. The business case should clearly demonstrate the potential benefits and clear business value for the department, with a focus on solving real business and operational needs and with clear measures of success. Supported by business value analysis, the business imperative can be shaped, focusing on the value needs of the business versus the ability to deliver cost effectively.

You need to be clear in highlighting the key public sector challenges for your department, one which could be providing more responsive and cost-effective delivery of services to your customers.

KM can help to establish competitive advantage, effective decision making and innovation by managing the required relevant resources and people's intellectual capital to achieve effective service delivery (Schutte and Barkhuizen 2013).

Step 2: Create the Strategy and Framework

Recommended Activities: The KM strategy should put in writing, or if you have a current one, then it should be reviewed and rewritten if necessary. The strategy needs to be a workable document with key action-oriented goals, and the output of the KM maturity assessment can feed into this. Key here is to include a KM operating framework model which simply articulates the strategy and should ideally be presented on one page. The KM strategy for the public sector needs to be carefully planned out in order to succeed and deliver on promises. In addition, consideration should be given to creating a generic KM framework for the public sector by understanding and reviewing the multiple types of frameworks present in the private sector (Cong and Pandya 2003).

Ultimately, the KM strategy and the accompanying KM framework are key documents that should include alignment with the overall organisational or departmental strategy and should feature in KM governance (Kelleher and Levene 2001).

If KM exists at a higher government departmental level, then your strategy should be aligned with these key elements and drivers. Within the KM framework the following components should be considered:

- content management: improved management of unstructured information assets;
- collaboration: improved ability to connect and network with communities;
- expertise: improved support for the right environment for experts to share;
- learning: improved delivery of lessons learned and best practices.

The strategy should also include a clear KM definition with guiding principles for your organisation that are aligned with the highest government departmental vision. These could include aiming to foster better and faster decision making, improving collaboration and networking, and turning the department into a 'learning organisation' with the right culture and behaviours. Agreeing on a definition of KM can be challenging; two options are offered for review here:

> KM is a conscious strategy aimed at getting the right knowledge to the right people at the right time, and helping people share and put information into action in ways that strive to improve organisational performance. KM needs to focus on creating a culture of knowledge sharing and learning. (Swiss Agency for Development and Cooperation 2009b)

> To support our people, connections, expertise and content to increase operational effectiveness through improved collaboration. To enable us to more effectively identify, create, capture, share and reuse the knowledge of our employees & partners at the right time in the right context. To create the right environment and culture for our people to share their knowledge in a smarter way. (PDO KM Code of Practice 2015a)

Step 3: Implement KM Governance

Recommended Activities: Key to the success of any focused KM programme is the early establishment of the appropriate KM operational governance model. This should also include identifying a KM champion or sponsor at the most senior managerial level possible to steer the decision making and act as the KM ambassador across your department. The creation of a KM steering group with membership from key multiple stakeholders is essential. You should always try to be inclusive with KM and not try to operate it as a solo, stand-alone initiative.

To support the KM governance a clear set of approved supporting documents should be produced, including an all-encompassing KM code of practice, a KM policy and supporting guidelines and procedures. The KM governance should have senior representatives from business and be aligned and comply with the corporate governance model if one exists.

Step 4: Start Small with KM Pilots

Recommended Activities: Following approval from the KM steering group, it is advisable to start or restart your KM engagements with no more than three low-cost, low-risk 'proof concept pilots'. The pilot sponsors should be identified from the business or operations early on, together with influential stakeholders, and the focus should be on three key departmental drivers that need addressing. Recommended areas within public sector engagements, for example, include better access to learnings and best practices, better access to expertise, and better access to information and content to implement policy.

You should not enforce a consistent standard approach to the pilots, as they will certainly have different needs, and ideally you should use existing effective technology or an off-the-shelf solution on a cost-efficient basis to demonstrate the success achieved. Within PDO, following approval to start with KM, the approach endorsed was to start with three small pilots within a specific engineering function where there was a need for enhanced performance

due to expanding operations. For more details on the approach adopted for the introduction of the PDO KM pilots, see Chap. 18, 'KM and Organisational Performance with a Case Study from PDO'.

Step 5: Focus on People, Collaboration and Communities of Practice

Recommended Activities: Based on research and background experiences, it is argued that a key success factor for KM is to address the people, cultural and behavioural change elements, and that any programme which fails to embrace this will probably lead to failure, viewed as another IT project that does not live up to its promise. Within the operating KM team, you should ideally ensure that you have a team member with skills from a learning or HR background who has real experience with the people elements. Identify selected KM 'catalysts' across your department who can act as focal points.

You should emphasise collaboration and networking and build local communities of practice to improve internal collaboration, bringing together subject matter experts and those that need to learn and apply the knowledge. Communities are now a well-recognised tool to help with KM and can be effective in transferring more tacit public sector knowledge (Cong and Pandya 2003). Consider starting with face-to-face collaboration between public sector departments as a low-cost way to reuse and relearn from other colleagues and special interest groups.

In the UK, a good effort was made to create 'knowledge exchanges' as a means of improving collaboration, focused around supporting 'communities'.

The NHS was an exemplary example, creating a Public Health Knowledge Exchange (PHKE) to bring together the wider UK public health community, including forums and blogs (NHS and Department of Health 2007).

Another exemplary effort was the formation of the London Information Knowledge Exchange (LIKE), which was created and mainly self-funded by like-minded knowledge, records and information managers in London. Meeting on a regular basis in the evenings after work, this dynamic community has now grown to be a regular feature on the KM calendar in London.

People profiles has traditionally been a good area for a KM team to promote their services and encourage a better knowledge and skills sharing culture, with notable successes in organisations such as British Petroleum (BP), British Gas and the BBC. At IBM, their global solution, called 'Blue Pages', was credited with creating substantial savings in time and money and helping to connect staff members. The BP solution, called 'Connect', was enabled by the in-house KM team, where it was important to create the right environment for expertise and skills sharing (Collison and Parcell 2012).

It is also important to implement a targeted communications effort which provides clear and consistent messages on the value of KM to help gain active support from end-users and customers. The progress of KM should be communicated across the department and ideally across affiliated departments to help raise its profile. A distinguishable logo for KM should be created together with a supporting 'mantra' or slogan during the programme launch. PDO adopted a best practice approach to KM communications and created a new logo and branding during start-up (PDO KM Communications Plan 2015b).

Step 6: Build the KM Operations

Recommended Activities: Successful KM implementation in the public sector is dependent on the correct people resources being dedicated from an early stage. It is suggested that KM programmes fail because the operational KM people resources have not been forthcoming, leading to a lack of capability to deliver the programme. The creation of a small KM team is advisable, supported by a KM champion or sponsor as mentioned above. In addition, the KM operational structure should demonstrate a localised KM presence in the business using a more collaborative approach (Welton 2015).

The KM operating team can be situated in a variety of areas within the organisation, including the IT, HR, organisation and learning, and strategic planning departments. Although being aligned with a business performance improvement area is beneficial, equally important is having the senior sponsorship and budgets made available for implementation.

Examples of the desirable mix of skills and competencies that should be available across a KM team include:

- experience working with diverse and complex business challenges;
- the ability to identify, capture and promote the sharing of tacit knowledge;
- demonstrable experience of successfully working within challenging situations where KM can provide business benefits;
- experience in leading change or transformation projects, ideally with intranets and collaboration tools;
- creative, innovative 'out-of-the-box' thinker with a commitment to continuous improvement;
- confident and effective communicator.

For more details of the recommended KM operational roles which were successfully implemented in PDO, refer to Chap. 18, 'KM and Organisational Performance with a Case Study from PDO'.

Step 7: Introduce Selected KM Transfer Methods and Processes

Recommended Activities: To support a successful implementation in the public sector, the KM practitioner should consider introducing or reintroducing a selected range of proven KM transfer methods to support effective knowledge sharing, learning and collaboration. In the current context of tighter budget controls, public sector organisations need to look at more cost-effective solutions. The majority of these methods do not require technology and thus can be implemented effectively by a competent KM team. Selected KM methods and processes can all steer towards the generation of the 'learning organisation' within local government (Schutte and Barkhuizen 2013).

KM methods should be integrated into your KM framework and embedded into key departmental processes and procedures. For example, delivering a lessons learned event after each important stage, gate or milestone on a project can raise the profile of KM and add significant value. The methods in the knowledge manager's toolkit include:

- lessons learned and best practice capture
- after-action review
- knowledge harvesting
- capture of key knowledge
- peer assist
- storytelling.

The competent knowledge manager should be able to facilitate or support the delivery of most of the above methods to improve knowledge sharing and transfer of key information. These methods should be shared by all across local government and beyond (IDeA 2008). Another advantage of using a small selection of proven KM transfer tools and methods such as those mentioned is that they don't necessarily have to use technology to be effective (Serrat 2010). A good example of usage, together with facilitation guidance, is widely available on the internet.

In the GCC, Dubai Government entities such as the Dubai Courts, Dubai Police and Dubai RTA have adopted clear processes to support their KM programmes (Biygautane and Al-Yahya 2013a, b, c).

Step 8: Consider the Use of Technology to Support KM

Recommended Activities: The KM practitioner should assess the available departmental IT capabilities to support KM, with more emphasis placed on collaboration, networking and connecting solutions in the first instance,

rather than looking at large-scale, expensive enterprise content and document management solutions where there are plenty of failed and costly stories of end-user not buying in. It is advised not attempt to develop in-house wherever possible, but to buy and modify off-the-shelf solutions in the first instance, commonly those that are cloud-based.

However, using collaborative technology alone to support knowledge sharing will not fully address the needs of the learning organisation, with the human touch and access to live subject matter experts being crucial to success. KM collaborative tools can assist with faster connection to these experts (Kelleher and Levene 2001)

The newly termed social workplace IT tools that focus on collaboration should be evaluated by the KM team and could include vendors such as Microsoft SharePoint, Slack, Yammer and Igloo. The use of these types of solutions appears to be more intuitive for the end-user, allowing them to work more efficiently with little or minimal training and support. Examples of successful KM technology solutions include people profile management, collaboration teams and project sites, communities of practice and lessons learned knowledge bases.

Step 9: Focus on Performance and Value Management

Recommended Activities: For any KM initiative that is implemented, it is essential to show the real benefits being achieved by the programme. Similar to large change management and learning initiatives, it's important to have measurements in place to assess progress against the desired outcomes. This is particularly important in the government sector where, in the majority of cases, all expenditure justifications need to be communicated to the general public and key government stakeholders. For the public sector, performance improvements should focus on managing knowledge that could reduce the cost of operations and improve customer services delivery (Cong and Pandya 2003).

KM benefits can be both direct and indirect, and can be measured in terms of improved processes and measurable outcomes. A set of KM key performance indicators (KPIs) should be agreed for consideration. There are numerous metrics available to measure progress, many of which come from the human capital world, and below are some high-level examples of how they could be grouped for evaluation.

Improved customer responsiveness and satisfaction:

- faster access to cross-government departments' knowledge bases to support customers;
- improved responsiveness;
- improved customer and stakeholder satisfaction levels with time to respond.

Internal efficiency and effectiveness:

- reduced time searching for relevant content and subject matter expertise;
- improved decision-making and planning capabilities;
- reduced IT, printing and publication costs.

Competency and personal development:

- improved employee capability development and growth;
- improved employee networking both internally and externally;
- improved personal development as subject matter experts with lifelong skills.

Improved innovation:

- improved communication and knowledge sharing between subject matter experts;
- more supportive environments conducive to innovation;
- bringing people together across departments to work more intelligently and effectively.

For examples of real KM benefits being achieved within an engineer project at PDO and more broadly with other external examples, refer to Chap. 18, 'KM and Organisational Performance with a Case Study from PDO'.

Step 10: Build a Sustainable Road Map

Recommended Activities: Finally, as your KM programme matures it will be necessary to build a longer-term and sustainable road map, and at least a five-year time line should be considered for full embeddedness and business transformation. Key to this is ensuring that adequate resources are maintained within the KM team to work closely with the organisational business. This will include the developmental needs of the KM team to ensure their competencies and skills growth, and it is advised that international KM certification (CKM) be offered to KM staff as part of their individual development plans.

A selected phased deployment strategy should be developed, identifying key areas to focus on over five years, which should be endorsed by the KM steering group and KM sponsor. For public sector organisations, internal collaboration and knowledge sharing should first be improved, supported by a robust intranet. Departments that have a key need and are willing to endorse

the KM strategy and provide the required resources, people, time and cost should be targeted and given high priority. As the KM programme matures, consider working more widely with external customers and stakeholders and start to capture, cleanse, review, package and transfer key 'knowledge assets' for the benefit of the wider public.

Conclusions

The research and the authors' own personal experiences indicate that the opportunities for KM to add significant value to the public and government sectors is still considerable. The past experiences of KM have been variable, with a strong initial focus on what is recognised as Release 1 KM, which was predominantly aimed at attempts to capture copious amounts of explicit data and information in the form of visionary all-encompassing 'knowledge bases'. This was to a large extent driven by the ambitions of IT companies and management consultancies, aiming to sell IT hardware and services. The unfair branding of KM as in the same container with documents and records management led to costly projects failing to deliver, with wastage of public funding.

However, there have been notable success stories in the public and government sectors. A common characteristic found was that these focused more on the improved 'connecting' of expertise, learning and knowledge sharing rather than the 'collection' of information, records and document management. The admirable attempts by both the NHS and local government in the UK to improve collaboration, learning and networking between local offices through communities and knowledge exchanges must be noted.

It was observed, however, that the challenges facing the public sector remain and may be even more pressing today, and with a focused KM attempt following proven best practices and practical implementation steps real added value can be achieved. The focus should be on collaboration, peer-to-peer learning, networking and communities and not IT driven. In addition, with the drive towards better preparation for the knowledge-based economy, there is a real opportunity to be more closely aligned with the human capital agenda and to nurture, build and support this most valuable asset. The proven approaches, methods and processes of the pure KM discipline will prove invaluable to steer continuous performance improvement success.

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22

KM and Project Management

David James Bryde, Christine Unterhitzenberger, Birgit Renzl, and Martin Rost

Introduction

In this chapter we aim to analyse the context, role, structures, processes, procedures and problems associated with managing knowledge in projects. In doing so we focus particularly on the interactions and intersections between knowledge management (KM) and project management (PM). The imperative for effective KM can be viewed through the prism of poor performance in relation to PM. For example, recent reports indicate that organisations are wasting on average €97 million for every €1 billion spent on all projects (PMI 2017). In addition, PM practitioners and others involved in projects believe that 6% of projects are 'wholly unsuccessful' and that less than 22% of all projects undertaken wholly meet their objectives (APM 2016). These figures, which are consistent with previous reports on project success and failure, show that there continue to be deficiencies in PM and that part of the problem is a failure to effectively manage knowledge both within a project and between projects. Hence there is an urgent need to improve KM in PM.

D. J. Bryde (✉) • C. Unterhitzenberger
Liverpool Business School, Liverpool John Moores University (LJMU), Liverpool, UK

B. Renzl • M. Rost
University of Stuttgart (UoS), Stuttgart, Germany

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We start the chapter by setting out the context in which PM takes place, emphasising the complexities associated with managing projects. Specifically we identify four strands to this complexity, namely: the multidimensionality of measures of project success; the diverse and often conflicting perspectives of project stakeholders as to which dimensions are important; the failure to learn lessons and the tendency to repeat the same mistakes on projects; and the fact that projects create temporary structures that often comprise multiple organisations. We stress that the existence of these four strands means that PM takes place in a complex environment that has repercussions and creates challenges for effective KM. Next we discuss KM activities in relation to the defined and, to an extent, formalised PM processes and procedures that are undertaken throughout the project life cycle (PLC), highlighting how KM is integral at all stages of the PLC, from initiation of a project through to its handover and closure. Within this broad topic we analyse how learning takes place in project contexts and we highlight problems that are typically encountered in capturing and using knowledge in PM. These sections primarily consider the management of explicit knowledge and so in the following main section of the chapter we shift our focus to consider the tacit dimension of knowledge and projects. Here we discuss how social networks in project contexts and the build-up of social capital and trust are enablers of knowledge sharing in PM. In the final section of the chapter we briefly consider some future trends that might impact on KM in PM, specifically the increased use of artificial intelligence (AI) and machine learning (ML). We finish by drawing some conclusions and suggesting some implications for KM and PM theory and practice.

Context Issues

There are specific contextual issues relating to the delivery of projects that create unique challenges in relation to KM and PM. A useful macro-perspective is to view these challenges in terms of the topic of complexity, which encompasses:

- the complexity *in* projects, that is, dealing with complexity that is specifically focused on the PM challenges internal to individual projects;
- the complexity *of* projects, that is, recognising a wider perspective where individual projects are open systems that interact with other projects, programmes and portfolios of projects, and organisational factors at the macro-environment level. Here PM has to integrate with people, systems

and organisations outside the individual project that is being delivered (Geraldi et al. 2011).

Effective KM in PM helps to address both the complexity *in* and the complexity *of* projects.

In dealing with the different strands of complexity there are a number of broad issues that impact upon KM in PM. In the remainder of this section we will briefly consider each of these issues.

Firstly, the success criteria for projects are typically comprised of many dimensions, and the number of dimensions has grown over time as the discipline of PM has evolved from its roots as a management discipline in the middle of the twentieth century. Traditionally PM success was measured using a small number of criteria related to the 'iron triangle' of PM, namely: time, cost and quality (Atkinson 1999). In order to manage the iron triangle, KM in PM would be focused on these three dimensions, for example through the generation and sharing of information about project performance using the means of schedules (time criterion), budgets (cost) and specifications/standards (quality).

While managing these dimensions is still of prime importance in terms of effective PM, over time there has been a growing acceptance that there are other important performance dimensions that need to be considered in areas such as health and safety, client/user/stakeholder satisfaction, sustainability and quality assurance through adherence to defined processes and procedures (Mir and Pinnington 2014; Shenhar et al. 2001). One implication of this development is that the breadth of knowledge that needs to be generated, shared and, ultimately, managed has dramatically increased to encompass all of these dimensions. This creates challenges for those undertaking KM in PM in terms of the sheer volume and diversity of data which need to be converted into useable knowledge, to both measure and manage performance against the various multiple success criteria.

A second issue is that, alongside the broadening of the scope of KM in terms of covering all the dimensions of success, there is a similar recognition that project success can vary depending upon the perspectives of multiple stakeholders (Davis 2014) and, to further complicate things, different stakeholders may have competing values (Walton and Dawson 2001) and be looking for different things from the same project. In some cases, success for a particular stakeholder may be to see a project either fail to meet its objectives or be cancelled (Bryde 2005). Given that knowledge is power, project stakeholders may seek to use the information they possess in order to advance their own goals and agendas in relation to a specific project, which might not

necessarily align with the stated project goals and, in these extreme cases, may actually be at odds with the stated aim and objectives of the project. If this problem is not recognised and mitigated, the KM part of a PM system can become subverted. For example, information might not be shared between people both inside and outside the project team and misleading data about the actual progress of the project might be fed into the PM system by individuals, for instance in order to hide perceived bad news from clients and other interested parties.

Thirdly, in terms of the wider environment outside individual projects, the statistics relating to project failure and poor PM performance, outlined in the Introduction to this chapter, are testimony to the fact that lessons often are not being learned from undertaking projects (Von Zedtwitz 2002). As a result of this failure to learn, PM capability for the future delivery of projects is not being enhanced or maximised. Indeed, the PM capacity and capability agenda is of increasing importance as project-focused industries and PM-related professional bodies seek to enhance levels of performance and achieve better outcomes for stakeholders in terms of project delivery. KM has a fulcrum role in working towards delivering against this agenda, as it is through knowledge sharing between current projects and from past projects to current projects that future projects can obtain information that will better enable PM to deliver desired outcomes. Furthermore, there is a time imperative for this need to build PM capacity and capability. As the age profile of a typical project manager rises, unless there are mechanisms to share the wealth of knowledge that these individuals acquire over many years of work experience in PM with those individuals that are just embarking on their PM careers, there will be a further drop in PM capability. This will happen as the experienced people leave the industry and their accumulated knowledge of PM best practices leaves with them. To counter this, evidence suggests that KM processes, in the form of formal lessons learned systems, coupled with other activities such as establishing developmental perspectives for project managers through creating career paths and opportunities to gain qualification, positively relate to PM competence retention in organisations (Ekrot et al. 2016).

Fourthly, there are issues related to the structures that are formed to ensure that projects are delivered successfully. By definition, projects have designated start and end dates. Hence, for the purpose of undertaking the project, a temporary organisation is formed for the duration of the project. This temporary organisation exists only as long as the project and is liquidated after its end date. This temporary nature of the organisational structure brings some specific challenges for KM in projects as the project team members work together only for a limited time and move in different directions after the end of the

project. This means that the knowledge developed and acquired during the project needs to be managed while the project is still running or shortly thereafter, as otherwise the temporary organisation no longer exists.

This is even more applicable for temporary multi organisations (TMOs), where project structures are formed not only for a limited time (Granqvist and Gustafsson 2016) but from different firms, that is, the project is not undertaken within a single organisation, but rather multiple organisations are brought together temporarily to work on a specific project (Cherns and Bryant 1984). These organisations are likely to have an abundant number of boundaries which need to be overcome in order to work together effectively and efficiently (Baiden et al. 2006). Boundaries in TMOs include the apportionment of cultures, organisational climate, knowledge, fields of expertise, practices, resources, roles, organisational types, group and individual functions and so forth. In addition to the temporary nature of projects, these boundaries between the multiple organisations involved in a project make it more difficult to find ways, opportunities and willingness to manage knowledge successfully. These organisations might be working in the same field of expertise and therefore likely to be competitors for other projects, or they might be working in a completely different field of expertise and therefore don't have much in common. This can lead to situations where project team members don't share the necessary information for the project because (1) they fear that their competitors might misuse this information or (2) they don't know which information the other project team members need as they don't understand the others' profession.

A fifth issue relates to different dimensions of complexity, which addresses the complexity *in* as well as *of* projects and therefore the inside and outside perspective of the project. In general there is a differentiation of three dimensions of complexity (Geraldi et al. 2011): firstly, the structural complexity includes the above-mentioned issue of TMOs, but is not limited to it as structural complexity is also concerned with the number of individuals, time zones, locations and disciplines involved, the financial scale and the number of interdependencies. Secondly, the socio-political complexity is interested in the project's goals and objectives, the sponsors' and stakeholders' commitment to the project and the divergence of the people involved. Thirdly, the emergent complexity involves novelty and maturity in the project, clear success criteria, previous experience and changes imposed on the project. These dimensions of complexity determine factors of both types of project complexity (*in* and *of)* and therefore summarise the various issues KM and PM are facing. When we talk about managing knowledge in projects, we need to make sure that the best practice which

was developed to manage the project and its complexity is shared and not lost after the temporary (multi) organisation comes to an end.

To summarise this section, the presence of these four strands of complexity means that the context in which KM takes place in projects is often very different to the environment in which operations or business-as-usual (BAU) activities are undertaken. The unique context in which PM takes place has repercussions and creates challenges for effective KM. In the next section we outline in more detail how knowledge is managed throughout the PLC and discuss the different PM processes and procedures for KM.

Managing Knowledge Throughout the Project Life Cycle

Reflecting the temporary nature of projects, the project management function is responsible for managing the activities that are required to meet the project aim and objectives throughout its life cycle, that is, from when a project is first initiated through to when it is finally closed or terminated (Patanakul et al. 2016). Knowledge needs to be captured and used throughout this life cycle and hence KM-based processes and activities need to be built into all stages of the project's life in order to manage these processes and activities and ensure effective and timely delivery. The US-based Project Management Institute's (PMI) PMBOK® guide identifies five broad process groups that are undertaken during the project life cycle: planning, which describes how the project will be managed; executing, which focuses on ensuring the project team works together to complete the work; monitoring and controlling, where checks of the progress of the project and correction of problems takes place; and finally closing, which is the formal closing down of each phase or the receiving of approval of the work undertaken for the phase or project (PMI 2013). A typical life cycle, which has a number of phases taking place over time, involves the following: concept, where the initial idea is developed; definition, in which the preferred solution is identified and refined; development, where the plan is executed; handover and closure, which sees delivery of the end product or service and formal closure; and benefits realisation (APM 2012). While some processes are predominant in particular phases, they are not confined as such; for example, the planning process typically takes place in the first two phases, but continues through all phases, all the way into benefits realisation. In this way there will be a focus on not only codifying lessons learned but also promoting the measurement of benefits, which will enable the improvement of both intra- and inter-project practice (Fuller et al. 2011).

In terms of the five processes described by the PMI above and the phases of the project life cycle as defined by the UK-based Association of Project Management (APM), KM activity needs to focus not only on one process or phase but on all the processes and phases. This may require a change of mindset in terms of PM, where the focus of KM activity might be on the closure process and the closure and handover phase. For example, Patanakul and Shenhar (2012) describe a traditional mindset typically found while undertaking the execution process, which has a very operational focus on getting the job done, to include a focus on the wider business and strategic issues associated with executing the project, so that execution will be undertaken efficiently (operational focus) and effectively (strategic and business focus). To achieve both efficiency and effectiveness, the authors argue, requires an emphasis on continuous team learning and hence the use of KM-type activities such as lessons learned throughout.

In broad terms the APM outlines the types of KM-based activities that need to occur as the processes are carried out in each phase and identify two broad categories: knowledge capture in projects and knowledge use (APM 2012).

Knowledge capture on projects needs to occur during governance meetings held between the bodies responsible for the oversight of projects and the teams and within the project teams themselves. It typically takes places through the generation of project documentation and the carrying out of activities such as project (post-project) reviews (Newell et al. 2006, 167). Project team members are requested to capture the knowledge from previous projects, for example, in the form of lessons learned both during and at the end of the project. Once the knowledge has been captured, it has to be written down in reviews and entered into databases, together with the other project documentation. The reasoning behind that is that other projects teams might then be able to search the documents and enrich their knowledge and learn. Within teams knowledge capture might well encompass different companies and third parties that make up a TMO. Besides during internal reviews, it might also occur during audits and health checks, some of which might be carried out by bodies that sit outside the project organisation and which can have a remit to undertake KM activities in PM and facilitate knowledge sharing, such as a project management office (PMO) (Pemsel and Wiewiora 2013). Capture needs to be undertaken at key points throughout the project life cycle which, depending on the specific PM methodology utilised, can include gateways, red–amber–green (RAG) go/no-go points and end of stage/phases—see, for example, the PRINCE2® methodology (OGC 2009). Typical uses of knowledge at different points in time include: to help develop a robust business case;

to define the governance approach; to identify solutions to problems; and to improve both personal and team performance (APM 2012). Research has identified various tools to capture and use knowledge through sharing in PM, which encompass attempts to cover both explicit and tacit knowledge. Tacit knowledge is captured through post-project reviews, project meetings, consulting individuals, communities of practice, technical forums, brainstorming sessions and conferences/training, while explicit knowledge is captured through project review files, intranets, skills/expertise databases, lessons learned documents, best practice sheets, Wikis, audit documents, defects avoidance and feedback systems (Carillo et al. 2013). Frameworks for KM in projects seek to promote systemic approaches to manage both explicit and tacit knowledge. For example, Kasvi et al. (2003) propose a Learning Project Model which uses the medium of project workshops to update two project documents on a dynamic and evolving basis: the Project Plan and the Team Contract. These two documents make up the repositories in which knowledge in captured. In the case of the Project Plan, 'hard' project knowledge including project definitions, activities and results are captured, and in the case of the Team Contract, organisational knowledge such as experience and capitalisation of lessons learned is captured. The repositories are updated on a regular basis, typically at milestone reviews at key stages of the PLC. Key to success is the recognition that KM in projects needs to be done in a systematic fashion, which will only take place if the project is being managed in a systematic fashion through the project management process.

Learning in PM Contexts

In general terms the unifying purpose of KM-based activities in PM is to learn both within an individual project and between past, current and future projects. The main formal method employed in PM to facilitate learning is the project review, which needs to take place throughout the project—though a specific method that is employed at the end of the PLC when the project work has been completed is called the post-project review. In respect of the post-project review, Garvin et al. (2008) describe how such activities undertaken in many companies are based on the US Army's After Action Review (AAR) process, in which there is a systematic review and an analysis framed around the following questions: What did we set out to do? What actually happened? Why did it happen? What do we do next time (which activities do we sustain, and which do we improve)?

The efficacy of all types of project review relates to their contribution to both single-loop and double-loop learning (Von Zedtwitz 2002). Single-loop learning typically focuses within an individual project at the operational level and, for example, takes place in weekly or daily project team meetings in which variances to the budget and schedule of specification are analysed and corrective action taken. Double-loop learning happens when more reflective and in-depth analysis takes place of the root causes of failures, which encompasses the consideration of systemic problems. It also typically will focus on exploiting opportunities, as well as dealing with threats, such as using knowledge captured to introduce innovative products, services and processes to the benefit of either the client or the organisations that make up the TMO. An alternative perspective distinguishes between learning activities that are internally focused, such as taking corrective action, and those that are externally focused, such as scheduled forums with project clients (Garvin et al. 2008).

A relatively recent trend witnessed in the UK in some project-focused industries, such as major infrastructure and construction projects, is to capture the intellectual capital built up over the life of public-funded mega-projects through the medium of 'learning legacies'. Such legacies usually capture and document knowledge in web-based depositories made available through open access in order to enable others to learn from the experiences of the specific project. Examples include the learning legacies for the London 2012 Olympics (Olympics Delivery Authority 2013) and the Crossrail London programme (Crossrail Ltd 2017). The London 2012 Olympics Learning Legacy shares knowledge in the form of programme organisation and PM micro-reports, case studies, champion (PM) products, research summaries and a video of an interview with Sir John Armitt, Chairman of the Olympics Delivery Authority. As well as providing similar material to the London 2012 Learning Legacy, the Crossrail repository recognises that for some people certain types of knowledge, documented in the form of PM templates, processes and procedures, would once have been regarded as proprietary to the project organisation and not to be shared. Hence the point is made prominently that 'Documents and templates that have been used successfully on the Crossrail programme can be "pinched with pride" by other projects'.

Problems with Capturing and Using Knowledge in PM

As has been highlighted earlier in the chapter, PM aims at capturing and using knowledge across projects mostly via project documentation and project reviews (Newell et al. 2006, 167). Project members are requested to capture

the knowledge from previous projects, for example, in the form of lessons learned at the end of the project. Once the knowledge has been captured, it has to be written down in reviews and entered into databases together with the other project documentation. The reasoning behind this is that other project teams might then be able to search the documents and enrich their knowledge and learn.

However, evidence shows that PM processes to capture knowledge, for example, through formal lessons learned and project reviews, often fail (see Keegan and Turner 2001). Project knowledge can be difficult to acquire and then, for some of the reasons outlined earlier in the chapter to do with the nature of the project organisation, can be difficult to share and hence utilise effectively (APM 2012). Typical barriers include lack of employee time to engage in the KM activities, a lack of resources, a lack of clear guidelines and a lack of senior management support (Shokri-Ghasabeth and Chileshe 2014). Other barriers include a perception of limited transferability of the lessons learned from one project to the other, and in some cases the project manager might not see it as part of their duties and consider it a distraction from delivering the project. One way in which some of these barriers can be overcome is by formally building KM-based activities into the PM process and building time and specific tasks into the project plans. In that way there will be guidelines in the form of documented processes and procedures, and time, resources and formal roles will be allocated to knowledge capture and use. If a formal PM methodology, such as PRINCE2® or an organisation's own propriety method, is mandated, and such activities are part of it, then a framework is provided in which knowledge can be captured and used. The final piece of the jigsaw is that senior management provide their support by ensuring that the method is applied in practice to all projects and that the time, resources and roles are made available and sorted as planned.

However, even when such formal PM methodologies are in place there can still be deficiencies in terms of KM. In respect of one of the prominent means to capture and use knowledge in projects, formal reviews either during or post-project (discussed earlier), there are four major barriers, three of which are: 'psychological'—an inability to reflect, or memory bias; 'managerial'—time constraints, any bureaucratic overhead; and 'team-based'—reluctance to blame others and lack of internal communication structures, which will be exacerbated when the team is formed as a TMO (Von Zedtwitz 2002). The fourth barrier identified by the author is classed as 'epistemological' and highlights possible limitations with an approach that assumes project knowledge is explicit, able to be codified and then generalisable to other contexts. In order to understand the limitations of this codification-based approach to

knowledge transfer across projects, it is helpful to reveal the underpinning assumptions about knowledge and how they apply to the PM context.

One assumption can be called the 'knowledge as possession' view (Blackler 1995; Newell et al. 2006). In this perspective, knowledge is something that can be articulated and transferred from one entity to another. Knowledge is possessed by individuals, project teams and organizations and can easily be managed. Critics of the knowledge as possession view have emphasised that knowledge is situated in social and organisational practices and relationships (Blackler 1995; Tsoukas 1996; Tsoukas and Vladimirou 2001). In this perspective, knowledge, or rather knowing, is embedded in practice and cannot easily be detached. Knowledge is regarded as highly personal. In this view, knowledge presupposes values and beliefs and is closely related to human action (Tsoukas and Vladimirou 2001). Knowledge is based on personal judgements and tacit commitments. Since knowledge is embedded in practice, direct knowledge transfer across projects where practices are not linked is not possible. The two perspectives reflect the two knowledge management strategies: codification versus personalisation (Hansen et al. 1999). Codification concentrates on making knowledge explicit and transferring it across projects, reflecting the possession view. On the contrary, personalisation emphasises the dialogue among the people involved in knowledge sharing to encourage learning. The personalisation strategy accepts that knowledge is closely linked to the activities of the participants and needs to be shared, reflecting the practice perspective. Indeed, relatively recent work to develop systemic lessons learned knowledge models recognises that KM in projects is part of a wider complex adaptive system, where the organisation undertaking a project is made up of people-related elements such as learning, culture and social, and systems-related elements such as technology, processes and infrastructure (Duffield and Whitty 2015). KM models which align these different elements, for example by using stories of past project experiences, can learn lessons for use on current and future projects (Duffield and Whitty 2016).

In order to understand the knowledge as practice perspective we need to know more about knowledge and its underpinning tacit dimension, which will be outlined in the next section.

Tacit Dimension of Knowledge and Projects

Tacit knowledge can be distinguished from explicit knowledge depending on how easily it can be articulated. Tacit knowledge includes a highly individual and context-dependent dimension of knowledge (Polanyi 1962; Tsoukas

2003, 2005), which is often called know-how or practical knowledge, for example, being able to play the piano, selling financial products or building excellent cars. Tacit knowledge is highly personal, nonarticulated, hidden, experience-based and skill-type bodily knowledge (see Polanyi 1983, 4f; Baumard 1999). It is constituted through action and is thus inseparable from action (Orlikowski 2002). It is a slow, costly and uncertain process to transfer tacit knowledge due to its context-based character (see Kogut and Zander 1992, 388). Knowledge develops in the situation at hand when people are involved in practical tasks. Thus, knowing is intimately related to practice (Argyris 1993; Cook and Brown 1999; Orlikowski 2002). Action and practice influence thinking and knowing, and vice versa. Thus, knowing reflects the highly dynamic process of thinking and acting performed by the participants involved within and across teams.

The individual as the primary repository of organisational knowledge is essential (Argote 1999). However, research demonstrates that sharing of ideas among members of an organisation is a prerequisite for developing collective knowledge and thus leveraging valuable knowledge assets within firms (Nahapiet and Goshal 1998; Wasko and Faraj 2000). It has been shown that collective knowledge emerges from interaction and dialogue between members of a community of practice (Brown and Duguid 1991; Wenger and Snyder 2000). The situated, socially constructed and dynamic character of collective knowledge has been emphasised (Blackler 1995; Cook and Brown 1999; Tsoukas 1996). Thus, besides creating new knowledge, it is important to share and disseminate knowledge within organisations. Fostering knowledge sharing among members of an organisation and beyond is a central issue for firms. Some research has considered connections between knowledge sharing and individual-level (person-related) factors such as attitudes, motives, gender (e.g. Bock et al. 2005; Miller and Karakowsky 2005) and personality traits (Matzler et al. 2008, 2011; Stock et al. 2016). However, environmental factors such as organisational culture, leadership and technology are also essential for the quality of knowledge sharing (e.g. DeTienne et al. 2004; Güldenberg and Konrath 2006; Sambamurthy and Subramani 2005).

In the project context, with its temporary nature and constraints on time, cost and quality, the members' bridging activities and their bonding is of vital importance (Newell et al. 2004). Hence learning between projects needs to go beyond a traditional sender–receiver approach, where lessons learned can remain 'messages in bottles' (Hartmann and Dorée 2015). Rather, as projects are connected through a potentially complex network of organisations (i.e. the TMO), the PM methods and norms and, crucially, the experiences of the

team members, learning needs to be seen as a social accomplishment that takes place between projects. Cross-project knowledge transfer is better able to handle the complexities if project managers and others involved in KM activities, for example PMO staff, are mindful of both the source and recipient of knowledge in such project contexts (Zhao et al. 2015). These aspects are reflected in the debate on social networks and organisational culture that will be outlined in the remainder of the chapter, which considers the topics of social networks in project contexts, social capital and trust.

Social Networks in Project Contexts and Trust

Knowledge sharing in temporary organisations is tempting since the focus on delivery, that is, time, cost and quality, neglects long-term relationships. However, knowledge and knowledge sharing within and across project teams seems to be growing in today's dynamic and fast-changing environment due to larger and more complex projects necessitating collaboration between different disciplines, more short-term contracts and the need for experienced workers to fill in quickly, as well as the need to develop new products and access new markets (Van Donk and Riezebos 2005). There needs to be an adequate culture that supports knowledge sharing. Literature has identified the following values which especially support an adequate knowledge sharing culture: trust, care, team orientation, autonomy, long-term orientation, openness and risk orientation (Mueller 2015). Teamwork, participation and cohesion are especially important for the sharing of tacit knowledge (Keskin et al. 2005; Wiewiora et al. 2014). Thus, the social network matters. Social networks can be characterised as a set of relationships between several actors (Brass et al. 2004). In describing networks, a key factor is the strength of ties. According to Granovetter (1973), ties are classified as weak and strong ties. The strength of a tie is determined based on a combination of amount of time, intensity of emotions, intimacy and reciprocal interaction (Granovetter 1973). Weak ties are important for creativity, because you get additional information from these network partners. However, strong ties are related to trust and friendship (Tasselli et al. 2015) and thus facilitate knowledge sharing (Renzl 2008). Communities of practice, as discussed in more detail earlier in the chapter, for instance, are places where project managers share knowledge and develop strong ties with other project managers (Bettiol and Sedita 2011). They share knowledge in order to help each other with their work and to learn (Wenger et al. 2002).

Social Capital

Social capital is defined as 'the sum of actual and potential resources within, available through, and derived from the network of relationships possessed by an individual or social unit' (Nahapiet and Goshal 1998, 243). Social capital thus includes both the network and the assets that may be mobilised through the network. Social capital facilitates knowledge sharing in projects since it affects the three core mechanisms of knowledge management—opportunity, motivation and ability (Argote et al. 2003). Empirical evidence shows that project teams' social capital enhances learning about market conditions, products and technologies as well as project management across projects (Bartsch et al. 2013). Thus, project teams' social capital symbolises a means for sustaining knowledge within the fragmented and discontinuous environment of project-based work. The bonding view of social capital is based on trust between the members of the network that is strong enough to allow them to pursue common goals.

Trust

It is widely acknowledged that trust between project members is important for projects to be successful, particularly in inter-organisational projects. Among others, outside project partners are a source of new knowledge about technological developments and customer needs (Maurer 2010). Trust is about expectations and predictions of a collaboration partner's behaviour (Mayer et al. 1995; Rousseau et al. 1998). Higher levels of trust lead to increased motivation to share knowledge among project partners and increases product innovation (Maurer 2010; Nahapiet and Goshal 1998). Trust also affects knowledge sharing within and across teams. Trust in management, for instance, indicates the team members' faith in the team's goal attainment and their leaders being beneficial for the team members (Kim and Mauborgne 1998). When team members share knowledge, they trust that management will recognise the effort. Trust in management clearly affects knowledge sharing within and across teams (Renzl 2008).

If prior collaboration has been successful, project partners are keen to continue their partnership, as has been illustrated by Schwab and Miner (2008) in the film industry with special attention to the frequency of prior collaboration as a moderator. Ebers and Maurer (2016) provide evidence from the construction industry and show how collaboration affects satisfaction with the project outcome. With increasingly effective routines and coordination

mechanisms developing over the course of a relationship, the participants become more confident, extending past successful collaboration into the future (Ebers and Maurer 2016, 1883). Thus, social aspects and trust are key criteria and provide continuity for temporary organisations.

The Future: Artificial Intelligence and Machine Learning in KM in PM?

As a final topic for this chapter, we finish by briefly considering a possible future for KM in PM that reflects wider advancements and developments in technology. Some 30 years ago PM theorists and practitioners were projecting a future in which the PM process for KM would encompass software developments in the areas of artificial intelligence and machine learning (see, e.g., Hosley 1987). As Hosley explained in his 1987 paper, a part of the PM function relating to KM, in theory, lends itself to automation in the form of software-based expert systems. Such systems comprise logic trees, which provide pathways to a certain result or piece of advice, with the various branches of the tree being traversed depending upon the answers given to a series of questions—with answers typically taking the form of yes or no, a number or a selection from a number of descriptors. This process is useful for problems or issues that require interpretation, prediction, diagnosis, design, planning, monitoring, problem solving, repair, instruction or control—which are typical activities undertaken by PM.

Now, some 30 years after the paper by Hosley—and those by other authors writing on the same topic—the role of software in automating KM-related activities in PM might be becoming a reality. Chapman (2016) describes how the software company Microsoft recently released a beta version of a software tool, called AXAD Agency beta, using their Azure Machine Learning AI tool (Microsoft 2017), which provides an expert system to predict problems with project resourcing, budgeting and deadlines based on data from past and current projects undertaken by management agencies. It is claimed that the system can predict that a deadline for a task to be completed is likely to be missed and, using this information, the system will automatically contact an available freelance resource and book them to work on the project in order to complete the task. This is just one of many examples of AI tools for PM that are being brought to the marketplace. At the same time there is a growing discourse, predominantly led by software companies, consultancies and experts in the IT industry, to the effect that 'bots'—applications of AI—will

be a help to project managers in undertaking key activities such as planning, scheduling and resourcing (see, e.g., Nymand 2016). Yet if there is a lesson to be learned from the first wave of software-based technology that greatly impacted on PM, that is, the automation of project planning and scheduling in the 1970s and 1980s, it is that the application of such technologies can have unintended and negative consequences, for example, an overreliance on PMs practising technical skills in utilising the software at the expense of other essential skills, such as dealing with people. Furthermore, given that there are still many examples of poor PM performance despite the introduction of new technologies in the past, it is a moot point whether any new technology on its own can address the myriad and complex reasons for deficiencies in PM. As such, there is a second thread of discourse that asks balancing questions regarding the potential benefits of emerging AI- and ML-based technology (see, e.g., Lydon 2016).

Conclusions

To conclude, we have shown in this chapter how PM has to deal with complexities both within a project and in the wider environment outside the project. These complexities involve issues such as how project success is defined, who measures success, the systemic failure to learn from the performance of past projects and the existence of temporary (multi) organisations to deliver projects. Dealing with these complexities creates challenges for KM in PM. For example, there needs to be a clear understanding of how success is defined and how it will be measured by different project stakeholders in order to orientate and frame the capture and use of knowledge, so that success criteria are met. There needs to be a mindset shift in many project environments that puts learning at both the project and the intra- and inter-organisational level at the heart of PM processes and procedures throughout the life of a project, that is, from inception through to completion. Finally, there needs to be a recognition that the temporary (multi) organisations that are formed to deliver projects mean that barriers and obstacles to knowledge capture and use may exist that are not typically found in nonproject environments, and KM in PM needs to mitigate this.

We further demonstrate the importance of having well-defined and supported PM processes and procedures related to KM-based activities that are undertaken throughout the PLC and, specifically, not just at the end of a project when lessons learned, for example, might typically be captured. KM begins in the initiation stage of the project and continues through definition,

implementation and into handover and closure. Such PM processes and procedures that enable KM need to be aligned within an overall PM methodology, that is, capturing and using knowledge at key stages or milestones, and are more likely to be undertaken if built into project plans or schedules and mandated by management. The desired outcome of such activities, in the form of learning, will be optimised if PM activities encourage both single- and double-loop learning and will be widely disseminated if suitable databases and repositories for storing and making information available are present.

In our discussion of the tacit dimension of knowledge in project contexts, we highlighted how the complexities *in* and *of* projects can be addressed through the involvement and engagement of project participants, specifically through bridging and bonding activities across the networks that are formed by the creation of the TMO. Here there is a recognition that social relations are formed and that the sharing of tacit knowledge is more likely to occur where social capital and trust between individual project participants is high.

Lastly, in terms of our overall conclusions, it is claimed that a development that is likely to have a major impact on KM in PM is an increased use of AI and ML. Indeed, we are already seeing various interested parties, such as software developers and consultancies, bringing products to market in this area. While it is clear that such developments have the potential to support the PM in capturing, interpreting and using knowledge, to what extent it will help address the levels of failure outlined at the start of this chapter is a moot point. Lessons from history indicate that earlier waves of technology that impacted on PM, such as automated systems for project scheduling and monitoring, certainly helped make processes more efficient but often did not lead to the enhanced levels of project success that were anticipated. This is due to the fact that while processes and procedures are undoubtedly important, a key to successful PM is the effective management of people.

Finally, in terms of implications for theory and practice, KM and PM are now fairly well-established subdisciplines in their own right, each with their own conceptual underpinnings and fairly well-understood and defined processes and procedures. The challenge in projects is how to integrate the two, particularly how the concepts, processes and procedures of KM need to be adapted to be effectively and efficiently applied as part of PM. This is an area where research is still in its infancy and hence theory is still fairly immature. For practice there needs to a recognition that KM in projects needs to go beyond having a fairly limited focus on undertaking some lessons learned activities at the end of a project. Rather, it needs to take a broader and more holistic approach involving the capture and use of both explicit and tacit knowledge throughout a project's life. Such an approach requires, in practice,

both the establishment of and adherence to defined PM processes and procedures for KM, but also the development of a mindset that puts learning at the heart of PM and the active engagement of project participants in sharing and using knowledge with other people that are involved with delivering a project.

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23

Elucidating the Effect of Post-Training Transfer Interventions on Trainee Attitudes and Transfer of Training: A Mixed Methods Study

Agoes Ganesha Rahyuda, Jawad Syed, and Ebrahim Soltani

Introduction

Training and development play an important role in knowledge management, especially in identifying employees' knowledge and skill gaps (i.e., training needs analysis), and also in designing and providing suitable training programs (i.e., training design and delivery) to reduce those gaps (Buch et al. 2014; Sung and Choi 2014). Training may offer two benefits. First, an organization can help employees to acquire, transfer, create, and apply the new knowledge and skills necessary to help them at work. Second, the new knowledge and skills may help the organization ensure the success of a knowledge management program, which may subsequently contribute to organizational competitiveness and performance (Khaksar et al. 2011; Rechberg and Syed 2013; Zhao et al. 2014). However, it has been argued that learning acquired

A. G. Rahyuda (✉)
Udayana University, Bali, Indonesia

J. Syed
Suleman Dawood School of Business, Lahore University of Management Sciences, Lahore, Pakistan

E. Soltani
Hamdan Bin Mohammed Smart University, Dubai, UAE

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through participation in a training program has a limited impact on individual development and workplace performance in the absence of actual transfer of training (Baldwin et al. 2011, 2017; Blume et al. 2010).

There has been a growing interest in the notion of transfer of training within research and practice of training and development (e.g., Cheng and Hampson 2008; Johnson et al. 2012; Rangel et al. 2015; Saks and Burke 2012). Much effort has been invested in the study of the transfer of training, including the examination of post-training methods that may be deployed after training to enhance the transfer of that training, called *post-training transfer interventions* (Salas and Cannon-Bowers 2001; Tews and Tracey 2008). Two post-training transfer interventions that have dominated the literature over the last two decades are relapse prevention (RP) and goal setting (GS). The literature suggests that RP and GS interventions have an impact on attitudinal and behavioral outcomes of the transfer, which in turn impact the efficacy of training and subsequent organizational performance (e.g., Brown and Warren 2009; Burke and Baldwin 1999; Johnson et al. 2012; Pattni et al. 2007; Richman-Hirsch 2001).

Although RP and GS studies have dominated the post-training transfer interventions literature, there are several key issues that remain underexplored. First, significantly less research examines the process through which post-training transfer interventions are linked to training transfer, and the extent to which trainee attitudes mediate this process. Previous studies (e.g., Hutchins 2004; Latham and Seijts 1999) have also extensively focused on self-efficacy or a broad version of trainee motivation to explain this mechanism, without taking other important attitudes (e.g., readiness to change, autonomous motivation to transfer) into account. Second, the literature does not clearly explain the differential effectiveness of RP and GS, where most of the studies show contradictory results (e.g., Gist et al. 1991; Richman-Hirsch 2001). As a result, not only do we know little about the mechanism in the relationship between post-training transfer interventions, trainee attitudes, and transfer of training, we also know little about the distinction between RP and GS in influencing these attitudes and the transfer of training. Third, the literature does not shed much light on the nature of the relationship between post-training transfer interventions, trainee attitudes, and transfer of training in developing countries. Most studies have only focused on developed countries, such as Canada (e.g., Gaudine and Saks 2004), Israel (e.g., Tziner et al. 1991), and the United States (e.g., Latham and Brown 2006). Given that post-training transfer interventions are key to enhancing transfer of training, and the latter becomes the core element of a successful training program, the absence of studies exploring the interaction between these constructs in developing countries constitutes an important gap in this research area.

This study attempts to address these issues by examining the effect of both RP and GS on readiness to change, autonomous motivation to transfer, and transfer of training. At the same time, it also assesses the potential role of readiness to change and autonomous motivation to transfer as mediators to elucidate the mechanism linking post-training transfer interventions and transfer of training. The study is conducted in Indonesia, a major developing country in Asia, where training and development is regarded as a key tool to produce qualified human resources and to support long-term economic development (Bennington and Habir 2003; Habir and Larasati 1999). Conducting this study in the Indonesian context may add insights and develop greater contextual understanding to the literature regarding the relationships between post-training transfer interventions, trainee attitudes, and transfer of training.

The present study focuses on the following research question: *How do different post-training transfer interventions (i.e., RP and proximal plus distal GS) affect trainees' readiness to change, autonomous motivation to transfer, and transfer of training?* In this question, "do" means there is a need to know the direct and indirect effects of post-training transfer interventions on trainee attitudes and transfer of training, and "how" explains the process through which such effects occur (i.e., the mechanism). A sequential mixed methods approach is required, where a cognitive experiment (i.e., quantitative approach) is conducted to answer the "do" and is followed by interviews (i.e., qualitative approach) to answer the "how."

The chapter is organized as follows. First, we describe the theoretical background of the study and develop a series of hypotheses that offer a richer account of the relationships between post-training transfer interventions, trainee attitudes, and transfer of training. Second, we describe the research methodology and report the findings derived from the quantitative and qualitative data collected in Indonesia. Finally, we provide a discussion of the implications and contributions of the study.

Theoretical Background and Hypothesis

A General Overview of the Post-Training Transfer Interventions Literature

Post-training transfer intervention is defined as a set of procedures implemented after a training activity to help trainees transfer their newly learned skills to the workplace context (Tews and Tracey 2008; Tziner et al. 1991). Two post-training transfer interventions widely investigated in the transfer of

training literature are relapse prevention and goal setting. These are supplemental meta-cognitive techniques that help trainees to strengthen their awareness of environmental stimuli and use this stimulation to structure, understand, and manipulate their own cognitive processes (Wexley and Baldwin 1986).

In particular, RP is defined as a self-management intervention that teaches trainees strategies to overcome the potential threats (known as a high-risk situation) that impede the generalization of the newly learned skills (Marx 1986). GS deals with identifying a set of specific, challenging, and difficult goals to help individuals express attention, organize effort, increase determination, motivate strategy development, and improve overall performance (Latham and Locke 2007). There is ample evidence to show that RP and GS influence trainee attitudes (i.e., self-efficacy, motivation to transfer) and transfer of training (e.g., Brown and Latham 2002; Brown and Warren 2009; Johnson et al. 2012; Latham and Brown 2006; Latham and Seijts 1999; Milne et al. 2002; Richman-Hirsch 2001; Pattni et al. 2007; Wexley and Baldwin 1986).

There are, however, three key limitations in the literature. First, most research has tended to focus on the direct effect of post-training transfer interventions on trainee attitudes (e.g. Brown and Warren 2009; Gaudine and Saks 2004) and transfer of training (e.g., Gist et al. 1990; Pattni et al. 2007) rather than the explanation of mechanisms within this relationship. Following this mechanism issue, there is also a lack of clarity about the role of trainee attitudes as mediators linking post-training transfer interventions and transfer of training. To date, the literature has extensively focused on self-efficacy as trainee attitudes. Difficulties arise when an attempt is made to explain the extent to which trainees are ready to change their ineffective or inefficient way of working (i.e., readiness to change), or how far they may enhance their self-motivation to transfer the new skills to the job (i.e., autonomous motivation to transfer) after they implement a transfer intervention strategy.

Second, significantly less research offers empirical explanation of the distinction between RP and GS in influencing trainee attitudes and transfer of training. To our knowledge, in more than two decades there have been only four studies that have evaluated the relative effectiveness of RP and GS (i.e., Gist et al. 1990, 1991; Wexley and Baldwin 1986) on trainee attitudes and transfer of training, where the last comparative study was conducted a decade ago by Richman-Hirsch (2001). Moreover, these works suffer from inconsistent results concerning whether GS is better than RP or the opposite. This situation may lead to erroneous conclusions about what interventions contribute more to trainee attitudes and transfer of training and why, and what

interventions work best in what context, in what manner and for what reasons.

Third, there are few studies published in this field that offer a perspective from developing countries. The focus so far has been on developed countries (e.g., Canada, Israel, United States), missing out the insights from developing countries. Indeed, the literature would have been more interesting if previous studies had included new perspectives from developing countries. In particular, there are certain important contextual and institutional differences between organizations in developed and developing countries, such as the structure of the organization, economic resources and budget, and organizational culture (Holton et al. 2003; Subedi 2006). Such differences, in turn, may demand a different organizational approach to designing and conducting training, and may lead to divergent results. To date we know little about the effectiveness of post-training transfer interventions in developing countries.

We argue that these limitations hinder the advancement of the study of post-training transfer interventions, hence overcoming these issues is a must. In response to these limitations, we develop a mediating model that may be helpful in overcoming these limitations.

The Post-Training Transfer Interventions Model

The conceptual model illustrated in Fig. 23.1 has been developed to overcome the issues and gaps identified in the foregoing discussion. It includes two post-training transfer interventions (i.e., complete RP model and proximal plus distal GS) as the independent variables, transfer of training as a dependent variable, and two trainee attitudes (i.e., readiness to change and autonomous motivation to transfer) as mediators. In this model, RP and GS are illustrated as having a direct and positive effect on trainees' readiness to change and autonomous motivation to transfer. We also hypothesize that RP and GS will affect transfer of training, either directly or indirectly, through readiness to change and autonomous motivation to transfer.

In this study, readiness to change is defined as the degree to which individuals are mentally and physically prepared to adopt new ways of working in order to support their visions, achieve their goals, and enhance their performance (Simon 1996; Walinga 2008). Furthermore, autonomous motivation to transfer is defined as a desire to use the newly learned skills that is initiated by the self, that is, without external contingency (Gegenfurtner et al. 2009). Finally, transfer of training is defined as the extent to which trainees apply and

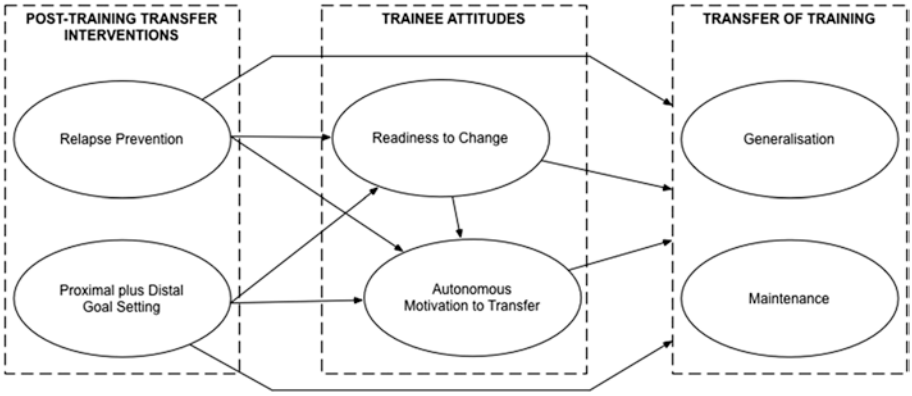

Fig. 23.1 The conceptual model of post-training transfer interventions

maintain their knowledge and skills learned from training to their daily job activities (Baldwin and Ford 1988).

We employ the social cognitive theory as the main theoretical foundation to explain the fundamental relationships between post-training transfer interventions and transfer of training. The social cognitive theory argues that human psychosocial functioning can be understood in the triadic reciprocal causation of three variables—environmental stimuli, individual behaviors, and individuals' cognitive factors—where human agency plays a central role: the individual acts as planner, forward thinker and self-regulator (Bandura 1999). However, the social cognitive theory emphasizes that the process in individuals' cognitive ability influences behaviors, without clearly explaining the role of individual attitudes in this relationship. In response, two theories were proposed to provide a theoretical foundation to the conceptual model: the transtheoretical model of change (Prochaska et al. 1992) and self-determination theory (Ryan and Deci 2000).

The transtheoretical model of change argues that it is important for the individual to have a self-management tool to stimulate and motivate them through the stage of change, so that when they feel they cannot proceed, this tool can help them to examine the advantages and disadvantages of not continuing the change process (Prochaska et al. 1992; Prochaska and Norcross 2001). The internalization part of self-determination theory explains that an individual takes a valuable action because they recognize that the action provides value to them, is coherent with their life or work principles, or is able to provide them with self-satisfaction (Gagne and Deci 2005; Ryan and Deci 2000). The combination of social cognitive theory and the internalization part of self-determination theory might explain why some cognitive-based tools enhance trainee attitudes, and in turn transfer behavior.

Below, we discuss these relationships in detail and hypothesize the resulting effects of post-training transfer interventions on trainees' readiness to change, autonomous motivation to transfer, and transfer of training.

Post-Training Transfer Interventions and Trainee Attitudes

Conceptually, one can expect both post-training transfer interventions to have an effect on trainee attitudes (i.e., readiness to change and autonomous motivation to transfer) despite limited previous interest in these particular variables (e.g., Choi and Ruona 2011; Gegenfurtner et al. 2009; Jones et al. 2005). Regarding the relationship between RP and readiness to change, we expect that RP intervention may positively influence trainees' readiness to change. This is because RP helps trainees overcome potential threats that might hinder the utilization of newly learned skills in the workplace, and in turn enhance trainees' preparedness in applying the new skills. We also expect that proximal plus distal GS positively influences readiness to change, albeit through a different mechanism than that of RP. In particular, trainees will be ready to change their inefficient way of working if they are provided clear guidance about the targets they should accomplish and the action they should perform to reach those targets (Antonacopoulou 2001; Brown and McCracken 2010; Prochaska and Norcross 2001). Some scholars (e.g., Brown 2005; Lawrence 1999), for example, have argued that if specific intervention tools, such as GS, are used to help trainees in transferring their new skills to the actual workplace, they are highly likely to change their way of working when it no longer fits the situation they face.

Hypothesis 1 The use of RP intervention positively contributes to the enhancement of trainees' level of readiness to change.

Hypothesis 2 Proximal plus distal goal setting increases trainees' level of readiness to change.

Readiness to change may also influence autonomous motivation to transfer. Some scholars (e.g., Colquitt et al. 2000; Ogbonna and Wilkinson 2003; Rafferty and Fairbrother 2015) have argued that when trainees feel prepared to adapt skills that are not helpful to their work performance, they may be motivated to do the job with the new skills as soon as possible.

Hypothesis 3 Trainees' readiness to change will autonomously enhance their motivation to transfer.

We also expect that both post-training transfer interventions will affect trainees' autonomous motivation to transfer, either directly or via readiness to change. As the internalization part of self-determination theory suggests, people are motivated to internalize the regulation of important activities (Deci and Ryan 2008; Gagne and Deci 2005).

Some scholars (e.g., Burke 1997; Chiaburu and Lindsay 2008; Curado et al. 2015; Narayanan et al. 2007) who have investigated the effectiveness of self-management tools in motivation have argued that the ability to detect and overcome specific cognitive or behavioral inhibitors that are stimulated by the organizational environment makes trainees comfortable with their skills, ready to change things that do not work, to plan and, although they work in less supportive environments, subsequently boost their desire to transfer the new skills.

The implementation of proximal plus distal GS intervention is also relevant for the enhancement of trainees' motivation to transfer. This is because the proximal plus distal GS is the only GS strategy that accommodates the importance of feedback. Certainly, receiving feedback will help trainees to monitor their progress pertaining to short-term goals (Anseel et al. 2007; Sitzmann et al. 2010). Subsequently, the combination of feedback and short-term goals will inform and direct trainees in subsequent strategies to achieve long-term goals (Van den Bossche et al. 2010).

Hypothesis 4 The utilization of relapse prevention intervention is an antecedent to trainees' autonomous motivation to transfer, either directly or via readiness to change.

Hypothesis 5 The utilization of proximal plus distal goal setting intervention is an antecedent to trainees' autonomous motivation to transfer, either directly or via readiness to change.

Trainee Attitudes and Transfer of Training

We argue that trainees' readiness to change also affects the transfer of training, either directly or indirectly, via trainees' autonomous motivation to transfer. Scholars (e.g., Gegenfurtner et al. 2009; Kontoghiorghes 2002) have argued that confidence in utilizing training skills and readiness to handle stimuli from the working environment are some necessary conditions for trainees to autonomously motivate themselves to use the skills. This in turn will lead to positive transfer performance, as several positive components (e.g., internal

desire) required for positive transfer are attached in the transfer motivation (Chiaburu and Lindsay 2008; Grohmann et al. 2014; Kontoghiorghes 2004).

Hypothesis 6 A high level of autonomous motivation to transfer will lead trainees to generalize and retain their new training skills back on the job.

Hypothesis 7 Readiness to change will directly influence transfer of training, and indirectly influence it through its effect on autonomous motivation to transfer.

Post-Training Transfer Interventions and Transfer of Training

We expect that both RP and proximal plus distal GS may directly affect transfer of training, and indirectly influence it through readiness to change. We use the notion of social cognitive theory to support these assertions. This theory argues that individuals can control their attitudes, achieve the desired transfer behaviors, and subsequently increase their performance if they understand the environmental stimuli that initiate their cognitive process and also know how to handle these stimuli appropriately (Bandura 1986; Wood and Bandura 1989).

Empirically, scholars (e.g., Burke 1997; Noe et al. 1990; Pattni et al. 2007; Seiberling and Kauffeld 2017) have supported this assertion by arguing that a self-management intervention tool positively affects trainees' readiness to eliminate the threats that prevent them from achieving positive transfer, and in turn influences the achievement of several transfer outcomes (e.g., course content retention, use of transfer strategies, use of trained skills). In addition, it is argued that the combination of proximal goals, feedback mechanism, and distal goal may mobilize trainees' efforts and readiness to achieve goals, which may subsequently affect their transfer action (Brown 2005; Brown and Warren 2009; Locke and Latham 2002).

Hypothesis 8 RP enhances training transfer directly, or indirectly through readiness to change.

Hypothesis 9 Proximal plus distal goal setting influences training transfer, either directly or via readiness to change.

We also expect that there are indirect effects of RP and GS on transfer of training through autonomous motivation to transfer. Scholars (e.g., Burke 1997; Tziner et al. 1991) have argued that the implementation of RP intervention helps trainees transfer their skills through the enhancement of transfer

motivation. This is because it has specific modeling characteristics that may influence trainees' cognitive ability, which in turn affects the transfer of training. On the effectiveness of GS, some scholars (e.g., Latham 2004; Luthans et al. 2008; Wood and Bandura 1989) have argued that the combination of short-term goals, a long-term goal, and feedback mechanisms may motivate trainees' actions, psychological capital, and also well-being, which may affect trainees' actual transfer actions.

Hypothesis 10 RP enhances training transfer directly, or indirectly through autonomous motivation to transfer.

Hypothesis 11 Proximal plus distal goal setting influences training transfer, either directly or via autonomous motivation to transfer.

The Differential Effectiveness of RP and Proximal Plus Distal GS

To date, there has been no theoretical argument or empirical evidence to show which of the two interventions (i.e., RP or GS) is more effectual in an organizational setting. However, based on the simplicity of the GS intervention, we theorize that GS has a greater influence on trainee attitudes and transfer of training. "*Relapse prevention*" is a new term for most trainees (Richman-Hirsch 2001), and as a result they need to invest much time to learn the concept, to understand the logic that underlies the term, and to assure themselves that this intervention will benefit them in terms of transferring the new skills. On the other hand, the term GS is familiar to employees in organizations, and developing a set of goals is sometimes a routine task for them.

Hypothesis 12 Proximal plus distal GS enhances trainees' readiness to change, autonomously motivates trainees to transfer their new skills, and contributes more to transfer of training than does RP.

Methodology

Research Context

The empirical setting of this study included employees of two private organizations in Indonesia. There are two reasons for using Indonesian organizations as a particular focus.

First, the importance of having qualified human resources to compete in the globalized economy has led Indonesian organizations to focus on training and development, which has in turn stimulated studies on the topic of training and development in Indonesia (Bennington and Habir 2003; Sutiyono 2007). Given that the concept of transfer of training is key to achieving successful training, many Indonesian scholars (e.g., Suhariadi 2005) have examined the antecedents of transfer of training in the Indonesian organization context. However, the research to date has tended to focus on trainee characteristics, training design, and work environment rather than on the impact of post-training transfer interventions on trainee attitudes and transfer of training. As a result, little is known about how the implementation of post-training transfer interventions would help employees to achieve positive transfer performance.

Second, as identified in the literature, most research in this particular field has been conducted in developed countries, for example, the USA (e.g., Hutchins 2004) and Canada (e.g., Latham and Brown 2006), rather than in developing countries such as Indonesia. As a result, we know little about whether the conclusions from the literature on the positive impact of post-training transfer interventions in developed countries hold true in the context of developing countries (e.g., Indonesia). Filling these gaps may offer fresh insight for both Indonesian organizations and the literature regarding how post-training transfer interventions influence trainee attitudes and transfer of training.

Research Approach

We used an approach called sequential explanatory mixed methods to answer the research question posed above. This approach systematically combines the quantitative and qualitative approaches in a single study in order to provide more comprehensive and meaningful answers to the research problems or questions (Creswell and Plano-Clark 2011). The approach used in this study is sequential because the quantitative method preceded the qualitative method, and explanatory because the qualitative method was used to further explain the statistical trends identified by the quantitative method.

Quantitative Study

Sample Description

In total, 160 employees participated in the quantitative study. Sixty percent of the participants were male, 72% held bachelor's degrees, while 81% of the

participants had working experience of between five and 14 years (mean = 10.5, s.d. = 4.1).

Design and Procedures

An experimental design containing three groups of a combination of a between-subjects and a within-subjects variable was used. The between-subjects variable was the post-training transfer interventions to which the participants were randomly assigned: the RP intervention group, the proximal plus distal GS intervention group, and the no intervention group. The within-subject variable was the time period to which the participants were exposed: before the intervention (the pre-intervention stage—Time 1) and after the intervention (the intervention stage—Time 2).

In the pre-intervention stage (Time 1), participants in all groups received identical time management training. Following this training session, participants completed a questionnaire measuring their readiness to change and autonomous motivation to transfer the time management training skills to the workplace. Approximately six weeks after the training session, participants were asked to complete an assessment of the trainees' training transfer behaviors: generalization and maintenance.

We conducted the intervention stage (Time 2) approximately six weeks after the pre-intervention stage. Each experimental group was treated differently. In the RP group, participants were asked to implement the RP intervention to support the transfer of training process. They were asked to identify the potential threats that might hinder the utilization of the new skills, and to develop a prevention strategy to overcome these threats. In the proximal plus distal GS group, participants were asked to set several proximal (short-term) goals related to their new skills. Subsequently, they were asked to discuss their goals with the trainer and were asked to set a distal (long-term) goal related to their new time management skills. In the no intervention group, participants were asked to do their best to achieve positive transfer performance. Following these experimental sessions, participants were asked to complete a set of questionnaires that assessed their level of readiness to change and autonomous motivation to transfer. Six weeks later, participants completed a set of questionnaires assessing their training transfer behaviors. All questionnaires were returned directly to the researchers.

Experiment Materials We used the original Relapse Prevention Model instruction that was proposed by Marx (1986) as the experimental material for the

RP experimental condition. For the proximal plus distal GS group, we developed a four-step material based on goal setting theory (Locke and Latham 1990). Each step from this material is developed based on the three important dimensions of this theory: specific, challenging, and difficult. These four steps were: (1) choose a skill to transfer; (2) set a distal goal; (3) break the distal goal into three short-term (proximal) goals; and (4) discuss these goals with their chosen trainers to ensure that the goals were achievable.

Measures

The following subsections describe the dependent variables that were used as measures in this study.

Readiness to Change We measured the three dimensions of readiness to change using nine items based on the University of Rhode Island Change Assessment (URICA) scale (DiClemente and Hughes 1990), adapted to the current research purposes. An example statement for this measure is: "*My previous skills do not help me much at the workplace*."

Autonomous Motivation to Transfer To measure the three dimensions of autonomous motivation to transfer, we developed a ten-item instrument based on the instruments from earlier studies (e.g., Gegentfurtner et al. 2009; Noe 1986; Ryan and Deci 2000). An example item is: "*When I invest effort to use these training skills, I do so because the advantages of transferring the skills is greater than not using it at the workplace*."

Transfer of Training To measure the two dimensions of trainees' transfer of training performance, we developed a ten-item scale based on prior research instruments, including those found in studies by Burke and Baldwin (1999), Hutchins (2004), and Wexley and Baldwin (1986). An example item is: "*I use most new training strategies that have been taught to improve my work performance*."

Data Analysis

To test the hypotheses, this study employed two statistical analysis tools: split-plot analysis of variance (split-plot ANOVA) and partial least square (PLS). Split-plot ANOVA was used to examine the impact of the experimental conditions (RP, proximal plus distal GS, no intervention) on measured variables.

It was also useful to assess the significance of apparent differences across the conditions. PLS was employed to examine the effect size of each post-training transfer intervention on measured variables, and also to assess the mediating role of readiness to change and autonomous motivation to transfer in the relationship between post-training transfer interventions and transfer of training.

Table 23.1 shows the mean and standard deviation for each of the groups (RP, proximal plus distal GS, and no intervention) for each of the times under study, and also shows the split-plot ANOVA results for each of the dependent variables. Tables 23.2 and 23.3 provide the PLS results for the direct and indirect structural model estimates respectively. Fig. 23.2 presents the overall structural model with path coefficients.

Test of Hypotheses

Split-plot ANOVA revealed that the change in mean scores of readiness to change across post-training transfer interventions was significant (*Wilks' Λ* = .820, F (2, 157) = 17.25, $p < 0.05$, $\eta p^2 = 0.18$). These results confirmed the effect of RP and proximal plus distal GS on readiness to change and supported Hypotheses 1 and 2. We used PLS to examine the direct effect of readiness to change on autonomous motivation to transfer. The results showed that there was no significant effect of readiness to change on autonomous motivation to transfer ($\beta = 0.12$, $t = 1.47$, $p > 0.05$). This rejected Hypothesis 3. To test Hypotheses 4 and 5, split-plot ANOVA and PLS were used. We found that the interaction effect between time periods and experimental conditions was significant (*Wilks' Λ* = 0.621, F (1, 157) = 95.88, $p < 0.05$, $\eta p^2 = 0.38$), suggesting that the implementation of RP and proximal plus distal GS directly influenced autonomous motivation to transfer. Based on the PLS results, the direct effect sizes of RP ($f^2 = 0.31$) and proximal plus distal GS ($f^2 = 0.27$) in influencing autonomous motivation to transfer are relatively similar. However, based on the indirect effect analysis, the results showed that the effects of both post-training transfer interventions on autonomous motivation to transfer via readiness to change were not significant (RP ➔ RTC ➔ AMT, $\beta = 0.085$, *sig.* = 1.469; and GS ➔ RTC ➔ AMT, $\beta = 0.089$, *sig.* = 1.451), thus Hypotheses 4 and 5 only received partial support.

From Table 23.2, it is apparent that Hypothesis 6, which states that autonomous motivation to transfer will affect transfer of training, received support with moderate effect size ($\beta = 0.26$, $t = 2.92$, $f^2 = 0.07$, $p < 0.05$). Regarding Hypothesis 7, PLS results failed to confirm the indirect effect of readiness to

Table 23.1 Quantitative results: the main results of the split-plot ANOVA

		Experimental conditions											
		RP (n = 54)		Proximal plus distal GS (n = 54)		Control (n = 52)		Interaction effect	Main effect	Between-subjects effect			
Dependent variables		Mean	SD	Mean	SD	Mean	SD			Size	RP × GS	RP × C	GS × C
Readiness to change	*Pre*	45.13	4.33	44.87	4.74	43.48	4.61	0.18	0.34	0.32	0.05	4.32[a]	4.27[a]
	Post	50.76	3.56	50.93	3.75	43.77	3.22						
Autonomous motivation to transfer	*Pre*	53.06	3.72	54.96	3.73	53.50	4.31	0.27	0.38	0.30	−0.79	3.37[a]	4.15[a]
	Post	60.39	3.70	60.06	3.88	53.21	3.39						
Transfer of training	*Pre*	52.63	3.47	52.83	3.42	52.29	4.09	0.29	0.35	0.30	−0.64	3.96[a]	4.60[a]
	Post	58.85	4.95	59.93	4.06	51.27	4.97						

[a]The mean difference is significant at the 0.05 level

Table 23.2 Quantitative results: structural model estimates

Structural relation	Path coefficient	t-value	f2	q2
RP ➔ RTC	0.69	12.40	0.66	0.17
RP ➔ AMT	0.61	6.90	0.31	0.06
RP ➔ TT	0.30	2.79	0.06	0.01
GS ➔ RTC	0.70	12.89	0.68	0.19
GS ➔ AMT	0.58	6.35	0.27	0.05
GS ➔ TT	0.39	3.92	0.10	0.02
RTC ➔ AMT	0.12	1.47	0.01	0.05
RTC ➔ TT	0.17	2.11	0.03	0.02
AMT ➔ TT	0.26	2.92	0.07	0.06

RP relapse prevention, *GS* proximal plus distal goal setting, *RTC* readiness to change, *AMT* autonomous motivation to transfer, *TT* transfer of training

Table 23.3 Quantitative results: Bootstrap results for indirect effects

			Confidence interval	
Structural relation	Indirect effect size	Sig.	LL 95 CI	UL 95 CI
RP ➔ RTC ➔ AMT	0.085	1.469	−0.029	0.199
RP ➔ RTC ➔ TT	0.113	2.047	0.003	0.228
RP ➔ AMT ➔ TT	0.157	1.980	0.002	0.312
GS ➔ RTC ➔ AMT	0.089	1.451	−0.026	0.176
GS ➔ RTC ➔ TT	0.119	2.070	0.006	0.231
GS ➔ AMT ➔ TT	0.148	1.966	0.000	0.296
RTC ➔ AMT ➔ TT	0.032	1.262	−0.018	0.081

RP relapse prevention, *GS* proximal plus distal goal setting, *RTC* readiness to change, *AMT* autonomous motivation to transfer, *TT* transfer of training

change on transfer of training via autonomous motivation to transfer (β = 0.032, *sig.* = 1.262), although it was found that the direct effect was significant (β = 0.17, t = 2.11, f^2 = 0.03, $p < 0.05$). This indicated partial support for Hypothesis 7.

Split-plot ANOVA results revealed that the change in mean scores of transfer of training across post-training transfer interventions was significant (*Wilks'* Λ = 0.820, $F(2, 157) = 17.25$, $p < 0.05$, $\eta p^2 = 0.18$), with both transfer interventions showing a small to moderate effect size (RP, f^2 = 0.06; and GS, f^2 = 0.10). We also found that the mediating role of readiness to change in the relationships between post-training transfer interventions and transfer of training were significant (RP ➔ RTC ➔ TT, β = 0.113, *sig.* = 2.047; and GS ➔ RTC ➔ TT, β = 0.119, *sig.* = 2.070). This supported Hypotheses 8 and 9. Hypotheses 10 and 11 also received significant support regarding the mediating role of autonomous motivation to transfer in the relationships between both post-training transfer interventions and transfer of training (β = 0.157, *sig.* = 1.980; and β = 0.148, *sig.* = 1.966).

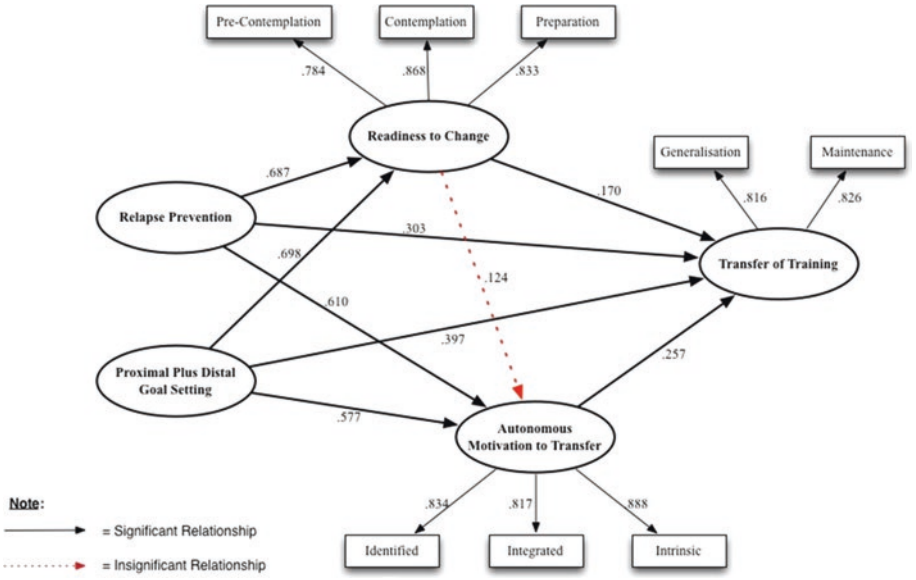

Fig. 23.2 Quantitative results: the overall structural model with path coefficients

We also investigated which post-training transfer interventions had higher contribution to readiness to change, autonomous motivation to transfer, and transfer of training based on their effect size. The results found that RP statistically made a slightly smaller contribution than GS in influencing readiness to change, but RP had a higher effect size than GS in directly affecting autonomous motivation to transfer. Furthermore, based on the calculation of total effect size, the results revealed that GS contributed more to the enhancement of transfer of training, either via readiness to change (RP, $f\ total = 0.173$ vs. GS, $f\ total = 0.219$) or autonomous motivation to transfer (RP, $f\ total = 0.217$ vs. GS, $f\ total = 0.248$). This indicates partial support for Hypothesis 12. Table 23.4 summarizes the results of the hypotheses testing.

Need for Follow-Up Qualitative Study

Several interesting results emerged from the quantitative study. For example, the results failed to confirm the influence of trainees' readiness to change on autonomous motivation to transfer. The results also revealed that both RP and GS had a larger effect size in enhancing trainee attitudes rather than

Table 23.4 A summary of the results of the hypotheses testing

Hypothesis	Statement	Outcome
1	*The use of RP intervention positively contributes to the enhancement of trainees' level of readiness to change.*	**Supported**
2	*Proximal plus distal goal setting increases trainees' level of readiness to change.*	**Supported**
3	*Trainees' readiness to change will autonomously enhance their motivation to transfer.*	**Rejected**
4	*The utilization of relapse prevention intervention is an antecedent to trainees' autonomous motivation to transfer, either directly or via readiness to change.*	**Partially supported**
5	*The utilization of proximal plus distal goal setting intervention is an antecedent to trainees' autonomous motivation to transfer, either directly or via readiness to change.*	**Partially supported**
6	*A high level of autonomous motivation to transfer will lead trainees to generalize and retain their new training skills back on the job.*	**Supported**
7	*Readiness to change will directly influence transfer of training, and indirectly influence it through its effect on autonomous motivation to transfer.*	**Partially supported**
8	*RP enhances training transfer directly, or indirectly through readiness to change.*	**Supported**
9	*Proximal plus distal goal setting influences training transfer, either directly or via readiness to change.*	**Supported**
10	*RP enhances training transfer directly, or indirectly through autonomous motivation to transfer.*	**Supported**
11	*Proximal plus distal goal setting influences training transfer, either directly or via autonomous motivation to transfer.*	**Supported**
12	*Proximal plus distal GS enhances trainees' readiness to change, autonomously motivates trainees to transfer their new skills, and contributes more to transfer of training than does RP.*	**Partially supported**

improving transfer of training. Finally, the results suggested that GS contributed more than RP in influencing transfer of training, either directly or indirectly, through readiness to change and autonomous motivation to transfer. Certainly, further exploration was needed to explain why these results occurred. In particular, more data were needed to comprehensively understand the trainees' perceptions of and reactions to the transfer interventions, hence revealing the potential mechanism or reasons behind the statistical trends explained above. This, then, led us to the qualitative study. Table 23.5 summarizes interesting results from the quantitative study and the follow-up qualitative steps that are required to respond to these findings.

Table 23.5 A summary of the quantitative results

Relationship	Key quantitative results	Key qualitative follow-up
Post-training transfer interventions and trainee attitudes	Effect size of post-training transfer interventions on readiness to change was larger than on autonomous motivation to transfer	Explore participants' reaction to the implementation of post-training transfer interventions and its impact on their attitudes
	Readiness to change did not influence autonomous motivation to transfer	Explore participants' views regarding this result, e.g., the existence of an indirect relationship that may negate this direct relationship, or the possibility that this relationship may simply not exist
Trainee attitudes and transfer of training	Autonomous motivation to transfer contributed more to transfer of training than did readiness to change	Explore participants' perceptions prior to the transfer action
Post-training transfer interventions and transfer of training	Proximal plus distal GS contributed more to transfer of training than did RP	Do a thorough examination via interviews regarding the process through which RP and GS influence transfer of training
	Readiness to change did not mediate the relationship between post-training transfer interventions and transfer of training, while autonomous motivation to transfer did	Specifically explore participants' views regarding their readiness to change, e.g., the existence of an indirect relationship that may negate this mediating role, or the possibility that this role may simply not exist

Qualitative Study

Interviews and Analysis

The qualitative phase of the research used a semi-structured interview approach to collect the data. Participants were employees who were previously involved in the quantitative study and indicated a willingness to participate in the follow-up qualitative study. In total, 16 participants from two experimental groups (i.e., RP and GS) agreed to be interviewed for the qualitative study. Sixty-three percent of the participants were female and 69 % held bachelor's degrees.

An interview protocol was designed to clarify the statistical trends evident from the quantitative study (see Table 23.6 for a summary of the interview guide). Each interview session was audio-recorded with explicit permission,

Table 23.6 A summary of the interview guide

Domain	Subdomain
Characteristics of participants	Gender
	Age
	Education
	Organizational position
	Length of work experience
The relationship between post-training transfer interventions and trainee attitudes	Personal perceptions regarding post-training transfer interventions before and after the experimental treatment
	Personal experiences with post-training transfer interventions
	The impact of post-training transfer interventions on participants' readiness to change and autonomous motivation to transfer
The relationship between trainee attitudes and transfer of training	The link between participants' readiness and motivation
	The link between participants' readiness to change and transfer of training
	The link between participants' autonomous motivation to transfer and transfer of training
The relationship between post-training transfer interventions and transfer of training	Specific items in post-training transfer interventions that urge participants to do transfer action (i.e., applying and retaining the training skills
	Specific mechanism in the link between post-training transfer interventions and transfer of training

conducted individually by the researcher, and lasted from 20 to 25 minutes in general. Furthermore, the interviews were transcribed, read, and reread to ensure that the data were mistake-free, and analyzed. Finally, the results were sent back to participants to confirm the coherence of the data. This study followed the content analysis procedure proposed by Sekaran and Bougie (2010), which consists of four main steps: coding, categorization, relationship recognition, and data display.

Key Categories

Based on the interviews, 14 subcategories were evident. Subsequently, the 14 subcategories were combined into five main categories: self-confidence to control, normative goal commitment, self-reliance, initiative, and creativity. Specifically, three categories (i.e., self-confidence to control, self-reliance, initiative) emerged from the RP group and three categories (i.e., normative goal commitment, self-reliance, creativity) emerged from the proximal plus distal

GS group. These categories explain the process through which both post-training transfer interventions (i.e., RP and GS) affect readiness to change, autonomous motivation to transfer, and transfer of training. Table 23.7 shows how the qualitative data were organized to infer conclusions. The categories and subcategories are presented in column 1 and defined in column 2. Column 3 explains the role of each category in explaining the relationship found in the quantitative study. The fourth column provides illustrative examples per subcategory.

Discussion

In this section, we integrate the findings of quantitative and qualitative studies, and use it as a foundation to answer the research question of this study: "*How do different post-training transfer interventions (i.e., RP and proximal plus distal GS) affect trainees' readiness to change, autonomous motivation to transfer, and transfer of training?*" In particular, we discuss the findings of this study to highlight the relationship between post-training transfer interventions, trainee attitudes, and transfer of training.

The Effect of Post-Training Transfer Interventions on Readiness to Change

The quantitative results indicate that both RP and GS influence trainees' readiness to change, although GS has a slightly greater impact than RP on trainees' readiness to change. The qualitative study reveals two important mediating mechanisms between RP and GS that explain why these interventions enhance trainees' readiness to change.

In the application of RP, the interviews reveal that after trainees implemented the RP experimental materials in the quantitative study, they appeared to be more confident with regards to learning and training, their ability to handle the work environment, and their belief that they could better utilize their newly learned skills. We call this variable *confidence to control* (explained in Table 23.4). Subsequently, the confidence to control impacts trainees' readiness to use the new skills in the workplace, to eliminate the factors (e.g., time pressure, lack of support) that hinder the positive transfer performance, or to completely change the way of working if necessary. This finding is consistent with previous research (e.g., Gaudine and Saks 2004; Mayo et al. 2012; Tziner

Table 23.7 Qualitative findings: a summary of the semi-structured interviews

No	(Sub)category	Definition	The impact of the category on quantitative results	Specimen example from interviews
1	***Self-confidence to control***	*A strong belief among trainees that post-training situations (e.g., new skills, environment) were more controllable after implementing the RP method*	*This category explains the process through which RP influences readiness to change*	
	Managing the skills utilization	Trainees were confident they could use the newly learned skills whenever and wherever these skills were required		*"These items* [items in the RP method] *help me to know when I should use these skills, and how these skills might improve my performance."*
	Coping with negative work situations	Trainees believed they could handle the obstacles faced when they went back to the office		*"Straight after I learned this method* [RP method], *I've seen in my mind how my supervisors might react and I know how to response to it. I'm ready."*
	Controlling the internal behavior	Trainees felt they could control their internal behavior when it was to their transfer performance advantage		*"Start eliminating your internal problems, start behaving like you really need these skills, then you are in position to demand more from your training experience."*
2	***Normative goal commitment***	*A "have-to" attitude towards the accomplishment of the goals in order to achieve positive transfer*	*This category explains: (1) the process through which GS influences readiness to change; and (2) the mechanism in the relationship between GS and autonomous motivation to transfer*	

(*continued*)

Table 23.7 (continued)

No	(Sub)category	Definition	The impact of the category on quantitative results	Specimen example from interviews
	Mindset of obligation	Trainees felt obliged to accomplish the goals they set, given the effort they put into the goal-setting process		*"I have to achieve these goals, I don't know what to say if I don't."*
	Determination to try	Trainees had strong willpower to try to achieve the goals		*"Last time I discussed these* [showing their goals plan] *with them* [feedback source]*, I suddenly know how important this direction is to me.* [And] *to try to follow that is a must. I'm prepared."*
	Persistence in pursuing the goals	Trainees would persist and remain consistent with the activities towards the goal achievement		*"Like my friend said* [his friend acted as the feedback source]*, stick to the plan and you are ready to go toward your target."*
3	***Self-reliance***	*A sense of self-worth among trainees, of being fit to be relied on in undertaking the activities they planned*	*This category explains the process through which both post-training transfer interventions (i.e., RP and GS) influence autonomous motivation to transfer*	
	Self-disciplined	Trainees could take action regardless their desires, perceptions, or feelings at the time		*"When I'm ready with my plan, I am nervous enough. But, no matter what, I need to move on."*

(*continued*)

Table 23.7 (continued)

No	(Sub)category	Definition	The impact of the category on quantitative results	Specimen example from interviews
	Responsibility	Trainees had a sense of being responsible for performing the task well		*"I was spending like three to four hours of my time discussing these goals. I know once I failed* [to achieve the goals] *I am the smiley dead man walking."*
	Organized	Trainees were able to structure and manage their transfer-related activities		"[Feeling that I] *can't wait to be back to my office? Yes, of course. I am able to draw every things needed for me in order to use these skills."*
4	***Initiative***	*A readiness to start a new series of directions or actions*	*This category explains the mechanism in the relationship between RP and transfer of training*	
	Self-starting	Trainees sought any potential opportunity to perform their newly learned skills		*"When I was thinking of my office, it seems like no opportunity to use these skills. But it was predictable. I need to find it by my own."*
	Proactiveness	Trainees tried to take preventive action rather than reactive action		*"I believe that once I wait for the perfect time* [to apply these strategies]*, I know I have wasted my time."*
5	***Creativity***	*A mental ability to produce new ways of achieving the target when the initial plan was not working*	*This category explains the mechanism in the relationship between GS and transfer of training*	

(*continued*)

Table 23.7 (continued)

No	(Sub)category	Definition	The impact of the category on quantitative results	Specimen example from interviews
	Flexibility	Trainees could create an alternative to the initial strategy to reach the goals		*"After the discussion* [with her feedback source]*, I found a space where I could develop plan B if this plan does not work."*
	Specificity	Trainees were able to further elaborate the details of their activities where required to further understand the flaws in the plan		*"This desire to use the skills help you push yourself a bit to the edge, to think what works what does not work, to visually draw the details of your effort so far."*
	Plan development capability	Trainees were able to modify the initial strategy to achieve the goals		*"I remembered that a bit of modification of the plan smoothed my execution of the strategy and the application of the skills."*

et al. 1991) which has argued that identification of threats, development of strategies to overcome threats, and creating transfer-related support network at the workplace enhance trainees' self-efficacy, self-confidence, and internal locus of control, which subsequently affect their workplace performance.

In the application of proximal plus distal GS, trainees reveal a different mechanism. They admitted in the interviews that the enhancement of trainees' readiness to change was evident because they had a mindset of obligation to achieve the goals, given the time and effort they had put into the GS process. Furthermore, after developing a set of planned goals and identifying the feasible ways to attain the goals, trainees admitted that they were determined to fulfill their plan, to see the results of their actions, and to be persistent in achieving the goals regardless of the challenges they might face in doing so. We called this *normative goal commitment* (explained in Table 23.4). This commitment in turn influenced their readiness to fulfill the planned goals, to eliminate the problems that might inhibit positive transfer, and to change their inefficient or ineffective ways of working. This mechanism might add new insight to the literature, as this study is among the few to link the proximal plus distal GS to trainees' readiness to change.

The Effect of Post-Training Transfer Interventions on Autonomous Motivation to Transfer

The quantitative results strongly support the influence of both RP and GS on autonomous motivation to transfer. This suggests that trainees who implement post-training transfer interventions find it simpler to enhance their motivation to transfer the new training skills to the workplace. Social cognitive theory supports this finding by stating that a greater connection between environmental stimuli and the individual's cognitive reaction leads to the enhancement of the individual's motivation to complete a set of tasks or reach goals (Bandura 1999; Beauchamp et al. 2016).

The qualitative findings indicate a similar mechanism in explaining the link between both transfer interventions and autonomous motivation to transfer. This mechanism involves the relationship between trainees' readiness to change and self-reliance (the definition of *self-reliance* is provided in Table 23.4). In the interviews, trainees admitted that their level of readiness to move towards their planned goals (admitted by the trainees in the GS group), or their readiness to eliminate the problems blocking their transfer performance (admitted by the trainees in the RP group), made them more disciplined, more organized in doing things in pursuit of the goals, and ready

to take responsibility regarding the potential results. This self-reliance autonomously motivated them to apply or retain the newly learned skills at the workplace. This suggests that self-reliance is an important value because, even with minimum support, the trainees believed they could still execute the transfer strategy they had planned. Gaining self-satisfaction and valuing an event as important to the self are two major indicators of autonomous motivation (Deci and Ryan 2008), where both are enhanced in this study by the existence of trainees' self-reliance.

However, there is another mechanism that only occurs in the GS group. This mechanism concerns the mediating role of trainees' normative goal commitment. Specifically, we find that the implementation of the proximal plus distal GS method enhances trainees' normative goal commitment, where the latter is seen as coherent with trainees' other important values (e.g., gain self-satisfaction, seek pleasure). In the interviews, trainees admitted that trying to achieve positive transfer performance was not about satisfying their organizations, their supervisors, or their colleagues, but about satisfying themselves, as they were aware of the importance of transferring the skills to enhance their performance. This suggests that the proximal plus distal GS method shapes trainees' determination, persistence, and mindset towards the goals, where the latter autonomously impact trainees' motivation to transfer. This finding corroborates the ideas of some scholars (e.g., Latham 2004; Roth et al. 2007) who have suggested that individuals whose action is coordinated by a set of goal-directed activities will voluntarily put their effort, time, or stamina into using the knowledge they have in order to attain the targets.

The Effect of Post-Training Transfer Interventions on Transfer of Training

The quantitative results suggest that the implementation of RP and proximal plus distal GS affect transfer of training, either directly or indirectly, through readiness to change and autonomous motivation to transfer. The findings are consistent with several studies in this particular research area (e.g., Brown and Warren 2009; Tziner et al. 1991) that have argued that the perception of applicability of trained skills (i.e., reaction) and the flexibility in skills usage are strengthened by the implementation of post-training transfer interventions, where this relationship subsequently helps trainees to combat long-term skills use decay. However, further exploration via qualitative study indicates two new mechanisms that explain these quantitative results.

Regarding the implementation of RP, the interviews reveal that trainees' *self-initiative* (explained in Table 23.4) may mediate the relationship between RP and transfer of training. It indicates that this initiative is enhanced because trainees understand the worth of the RP method in improving their performance (e.g., helping them to eliminate the negative transfer behavior), which subsequently leads them to take preventive rather than reactive action. This attitude in turn leads trainees to take transfer action (e.g., generalizing the skills).

On the implementation of proximal plus distal GS, the interviews reveal that the proximal plus distal GS session enhanced trainees' transfer performance because they believed there was a chance for them to be more creative in transforming the goals plan into real action towards the goals, that is, *creativity* (explained in Table 23.4). Furthermore, trainees stated that they were always flexible in translating their strategy in order to achieve the goals. They also added that their strategy was not rigid, and they always dedicated one to two hours outside their working hours for strategy development purposes if obstacles existed to the target achievement. It appears that the feedback process that is embedded in the proximal plus distal GS method may contribute to the emergence of trainees' creativity. This assertion is consistent with those of scholars (e.g., Shipper et al. 2007; Stobbeleir et al. 2011) who have argued that feedback-seeking activities are a resource for individuals to enhance their creativity, and this creativity subsequently becomes an important intangible tool to achieve creative performance.

The Differential Effectiveness of Relapse Prevention and Goal Setting

Although the two transfer interventions (i.e., RP and GS) appeared to be similarly effective in supporting trainees' readiness to change, autonomous motivation to transfer, and autonomous motivation to transfer, and transfer of training, the quantitative estimates of this study indicate some difference in the effect size of the interventions.

A possible explanation for some of the results may be the nature of the transfer tools themselves. Planning a distal goal requires a combination of a set of proximal goals and the feedback process, suggesting that there is some intervention from the individual's external environment itself. The feedback process can help individuals enhance their performance by informing them of the activities they should or should not undertake in order to be effective and efficient, the support they have, or the development program in which they

should participate in order to improve their knowledge or skills (Foster and Macan 2002; Macan et al. 2011). The assumption of this feedback process is that the individual has a credible and reliable feedback source to support this process. In the proximal plus distal GS, the feedback process plays a key role by informing trainees about problems they may not spot themselves, additional strategies to handle those problems, and the activities they should undertake in order to remain in line with their goals. This prepares trainees to take each step in the change process.

This intensive feedback process apparently does not exist in the RP method. Certainly, trainees who are new to the term "relapse prevention" are guided through the RP method, and the elements of the RP method and specific terms related to it that seem unclear to the trainees are explained. However, the trainees do not obtain any intensive and additional input regarding what will or will not work regarding their RP plan. This may explain the difference between RP and GS.

The distinctive features of the RP method may be due to its ability to help individuals identify problems that might lead to a lapse situation from three perspectives: the strength of the individual's knowledge or skills, the external environment, and the internal behavior (Marx 1982; Wexley and Baldwin 1986). In this study, these features were learned thoroughly by the trainees and subsequently led them to a set of strategies to overcome obstacles in order to smooth their transfer effort. In other words, by developing a set of strategies to overcome obstacles, trainees autonomously enhanced their desire to use or retain the skills at the workplace. This subsequently affected their transfer performance.

Another possible explanation may lie in the additional attitudes that appear after the implementation of each transfer intervention tool. The interviews reveal that the implementation of proximal plus distal GS enhances trainees' commitment to the goals in a normative way, where this attitude indirectly influences trainees' flexibility and development capability regarding the planned goals in a more creative way. The enhanced commitment may help trainees to become more prepared to face their workplace, which subsequently affects their creativity, and finally urges them to transfer their new skills. On the other hand, the interviews reveal that trainees whose action is directed by the RP method enhance their self-confidence to control, which in turn influences them to take the initiative regarding the transfer effort. The latter subsequently impacts trainees' transfer performance. This suggests that having commitment and creativity toward goals enhances trainees' transfer performance to a larger degree than having self-confidence and initiative regarding

the transfer effort. This mechanism may explain why GS has a greater role than RP in influencing transfer of training.

Implications for Theory and Practice

The first implication of these findings relates to the process through which the implementation of both RP and GS affect trainees' readiness to change, autonomous motivation to transfer, and transfer of training. The findings suggest that the way RP influences transfer of training through the enhancement of attitudes is different from that of proximal plus distal GS, where each change in attitude impacts the size of the transfer outcome differently. Therefore, scholars must be aware of this change in trainee attitude if they wish to enhance the impact of implementing post-training transfer interventions on transfer of training.

The second implication pertains to the differential effectiveness of RP and proximal plus distal GS. The findings suggest that scholars may be aware that a complex mechanism exists in the link between the post-training transfer interventions, trainee attitudes, and transfer of training. This mechanism is different for RP and GS, which might explain why one intervention provides a greater contribution to one transfer behavior and not to another. Therefore, scholars and practitioners might pay more attention to the impact of these two transfer interventions on trainee attitudes if they wish to achieve positive transfer of training performance.

The final implication of the findings relates to the integration of three theories (i.e., social cognitive theory, transtheoretical model of change, and self-determination theory) in this study. The findings empirically validate the role of trainee attitudes as mediators in the relationship between two cognitive-based interventions and transfer behavior (i.e., generalization and maintenance). The social cognitive theory emphasizes that the environment sends several stimuli to individuals' cognitive processes, where the latter influence the way the individuals behave or respond to these stimuli. However, the assumption that the cognitive processes influence behavior through the change in attitudes has rarely been tested. Using the transtheoretical model of change and self-determination theory as a foundation to explain the mediating role of readiness to change and autonomous motivation to transfer, this study adds to the social cognitive theory by confirming that cognitive processes influence specific individual attitudes before affecting behavior.

Theoretically, this study extends the literature by describing some potential mechanisms that have not been exposed in previous studies. It also provides,

for the first time, an empirical basis for the distinction between the complete RP model and proximal plus distal GS in influencing trainee attitudes and transfer of training. This information is important because it will help scholars to organize the large and diverse body of mechanisms in the relationship between post-training transfer interventions and transfer of training. In addition, this study may serve as a confident starting point for researchers in evaluating the effectiveness of current post-training transfer interventions with the final aim of constructing a better and more comprehensive set of transfer interventions. Practically, the study may assist decision makers, managers and trainers through better understanding of the indirect role of post-training transfer interventions in enhancing the success level of a training and development program. This information is key to creating a successful training program that could result in enhanced employee performance.

In terms of the study's limitations, we conducted an experimental-design data collection study among large private organizations in Indonesia. This may limit the extent to which the study's findings can be generalized to other national contexts and organizational sectors. However, this limitation in turn provides an opportunity for future research to replicate this study in diverse industrial and geographic contexts, with various aims, for example, to understand not only the differential effectiveness of RP and proximal plus distal GS, but also the differential effectiveness of these interventions across organizational settings and countries.

Conclusion

Training plays a key role in knowledge management (Zhao et al. 2014). However, if the new knowledge and skills gained from training are not transferred to the workplace, the investment made in training may be in vain. In this study, it has been shown that both types of post-training transfer intervention (i.e., RP and proximal plus distal GS) are powerful tools for helping employees to transfer their newly acquired knowledge and skills to the job. It is clear that the implementation of these interventions may enable positive trainee attitudes, which in turn may enhance trainees' transfer performance. The study shows that the mechanisms through which the post-training transfer interventions affect transfer of training differ to some extent between RP and proximal plus distal GS. This distinction needs to be thoroughly understood if scholars and practitioners wish to obtain an optimal impact from the operationalization of post-training transfer interventions in organizations.

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24

Knowledge Management in Developing Economies: A Critical Review

Mariam Mohsin and Jawad Syed

Introduction

Previous research suggests that performance and competitive advantage are determined more by what a firm knows than by manual labor (Grant 1996a, b; Kogut and Zander 1996; McIver et al. 2013; Pfeffer and Sutton 2000). In his works on the knowledge-based theory of the firm, Grant (1996a, b, 2002) suggests that knowledge is the key basis for sustainable growth and competitive advantage. This stream of research is also complemented by scholarship on the critical importance of the ability to rapidly create and effectively manage organizational knowledge (Bettis and Hitt 1995).

Managers and academics alike emphasize that knowledge management (KM) can bring about significant strategic outcomes, such as increased agility (Dove 2003), improved productivity (Wiig and Jooste 2003), innovation (Pitt and MacVaugh 2008), maximized intellectual assets (Teece 1998), and operational effectiveness (Hult et al. 2004). Subsequently, KM, "a set of management activities aimed at designing and influencing knowledge creation and integration (including processes of sharing knowledge)" (McIver et al. 2013: 597), has materialized as a significant organizational capability that forms the work setting (Foss and Mahnke 2003).

While attempts to theorize KM and to come up with effective frameworks are still under way, there is a dearth of research on the different kinds of

M. Mohsin • J. Syed (✉)
Suleman Dawood School of Business, Lahore University of Management Sciences, Lahore, Pakistan

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knowledge that exist across different contexts. The conceptualization of KM, like that of most management concepts, is predominantly Western, and does not seem to pay much attention to how KM may differ in non-Western or developing economies, where knowledge may be conceptualized in a very different manner. Developing economy concepts such as micro-finance (Morduch 1999) and Jugaad innovation (Radjou et al. 2012) may employ different knowledge patterns and implementation processes compared with technology-driven processes. With the migration of manufacturing and service industries to developing countries (Puffer and McCarthy 2011), emerging and newly industrialized economies such as China and India are increasingly relevant and significant due to the size of their markets and human resources. Managers in these economies face a different cultural complex when trying to implement KM systems (Strohschneider 2002), and as David and Fahey (2000) argue, culture shapes the behaviors central to the creation, sharing, and use of knowledge.

Much of the KM research that has been conducted in developing economies consists of empirical studies that seek to implement or validate preexisting conceptualizations of KM (e.g., Al-Sa'di et al. 2017; Eftekharzadeh 2008; Li 2004). Little research (e.g., Pio 2005; Sook-Linget al. 2015) has been conducted to investigate what KM is like in developing countries. Thus, there is a need to critically investigate how the cultural, social, and economic contexts in these economies interact with organizations and their KM systems. This chapter seeks to review the KM literature with specific reference to developing economies. For this purpose, it draws on a systematic review of literature on KM in developing economies.

The chapter is structured as follows: the next section discusses the importance of studying KM contextually, with specific reference to KM in developing economies. It is followed by the review methodology and its findings. Finally, some implications for research and practice are offered.

Contextualizing Knowledge Management

David and Fahey (2000: 114) view data as "raw or unedited observations about states of past, present, or future worlds," and information as "patterns that individuals find or imbue in data." Knowledge, instead, involves human experience and is dependent on context (David and Fahey 2000). It is a resource that is situated in individuals or groups, or is rooted in processes or routines. It comes to life in the form of concepts and rules, language and stories, tools and techniques (Blacker 1995).

Knowledge may be explicit or tacit. Explicit knowledge can be explained in the form of words, codes, rules, and processes (Smith 2001: 315). Tacit knowledge is what cannot be explained through words or codification (Smith 2001: 317). Related to implicit and explicit knowledge, David and Fahey (2000) present three types of knowledge that exist in organizations:

- Human knowledge: individual knowledge or know-how which may be manifested in a skill (e.g., how to sell a product) or expertise (e.g., good command over a software). Human knowledge may be explicit as well as tacit. It can be sentient as well as cognitive (Zuboff 1988).
- Social knowledge: exists only in interactions between people or within groups (e.g., a group of students who perform better together than the combined sum of all of them working separately). It is principally tacit, common among group members, and develops only as a result of working together (Orr 1996).
- Structured knowledge: rooted in organizational systems, routines, and processes. It is largely explicit knowledge. More importantly, this form of knowledge is assumed to be independent of individual knowers and is considered an organizational resource (Glazer 1998).

While it may be argued that knowledge cannot exist independently of humans, Zuboff (1988) argues that knowledge is regularly created and embedded in processes and routines. David and Fahey (2000) explain how knowledge can become embedded in routine and how with minimal human interaction this knowledge can be put to practical use, unlike unabridged data observations. This argument is of use for our purpose because in proving the embeddedness of knowledge in routines and processes, it is also made evident that there is also an accumulation of context to shape knowledge. This explains why it is important to study KM contextually.

Johns (2006) discusses why it is important to consider context in research. Among the many contextual elements that Jones describes, the most important and relevant to our discussion is "context as a shaper of meaning." Context, according to Cappelli and Sherer (1991), is the environment that surrounds a phenomenon under study and that exists in a larger unit of analysis. We argue that developing countries may not be inherently similar to developed countries, where most of the KM research is or has been conducted, and therefore based on economic, cultural, and social differences there is a very good chance that knowledge and KM may be understood in a different light in these countries.

Meyer (2006) observes that most of the organization studies researchers whose work pertains to Asian economies, including Asian scholars, take the safer route of authenticating their work by using meanings and conceptualizations borrowed from Western-based academic research. He advocates an innovative approach that highlights indigenous conceptualizations that could in turn potentially influence global management knowledge.

Puffer and McCarthy (2011), in a detailed review of business research in Russia, discuss how the KM of firms in Russia is integrally different from the mainstream conceptualization of KM. They discuss how this different conceptualization is a function of the country's traditional attitudes toward external knowledge and the economics of knowledge sharing. In particular, they refer to the rapid growth of the Russian economy. These arguments also apply to several other transition economies including China and India. We argue that investigations into the KM practices in these countries can introduce idiosyncratic concepts that may not only inform the broader management knowledge but also enrich the field of KM.

Review Methodology

We conducted a search through Elton B. Stephens Co (EBSCO) host and used the Business Source Premier database to limit our search to literature relevant to organization studies. Our review does not include studies of KM that were conducted purely within other disciplines such as library sciences and information systems. We made this decision in order to keep the scope of our review limited to KM in the context of organizations. We limited our search to the years 2000–2017, because much of the research on KM has been conducted in recent years, and an updated review of the state of KM in developing economies is expected to be timely and useful. We used the keywords "knowledge management" and "developing countries" to search the abstracts available in the database. The initial search turned up 245 articles. The search results were exported to Microsoft Excel. Each of the 245 articles was provided a numerical code which remained constant throughout the analyses.

We read the abstracts in detail to weed out any articles not relevant to KM in developing countries. Articles were included based on their relevance to KM, developing countries, and organization studies. All articles that were not relevant to developing countries or that were conducted in fields of study other than organization studies were excluded from the final review. Articles written in a language other than English were also excluded. Based on the above-mentioned criteria, 42 articles were finally selected and used for the systematic review. Table 24.1 offers an overview of the reviewed articles.

Table 24.1 Articles reviewed

No.	Author and year	Country	Paper type	Mention of context	Key findings and contributions
1	Lee Kean Yew and Terence Gomez (2014)	Malaysia	Empirical[a]	No	Founders' tacit knowledge in family-owned small and medium-sized enterprises (SMEs) is translated into codified knowledge through commercialization.
2	Eftekharzadeh (2008)	Iran	Empirical	No	There is a positive relationship between KM processes (sharing, generation, and storage) and KM performance.
3	Cathy et al. (2008)	Indonesia, Malaysia, Thailand, Sri Lanka	Empirical/ Theoretical	No	Social capital and knowledge management contribute to an understanding of the issue of information and communications technology (ICT) intervention and evaluation in developing countries.
4	Bennett et al. (2004)	Vietnam, Tanzania, Zimbabwe, Guatemala, Nicaragua	Empirical/ Theoretical	No	Successful transfer of accounting knowledge between countries with different economic and cultural contexts requires an understanding of their institutional structures.
5	Pio (2005)	India	Empirical/ Theoretical	Yes	It is crucial to tap into the tacit and traditional knowledge of employees. Acknowledging these forms of knowledge (such as the *guru-shishya* model) could make greater acceptance by Indian employees possible.
6	Sanayei (2005)	Iran	Theoretical	No	Proposes an integrated framework for customer relationship management CRM through the role of KM.
7	Li (2004)	China	Empirical	No	Identifies two antecedents of foreign market knowledge: intra-firm structural social capital and inter-firm relational social capital.
8	Kale (2009)	India	Empirical	Yes	Proposes the technological upgrading of knowledge-based firms in emerging countries by drawing back their citizens trained and educated in the USA.
9	Katerina and Mine (2007)		Theoretical	Yes	Provides perspectives from an artist and an economist and their insights on global knowledge work/workers.

(*continued*)

Table 24.1 (continued)

No.	Author and year	Country	Paper type	Mention of context	Key findings and contributions
10	Chuang (2014)	Taiwan	Empirical	No	Shows the coevolution of firms' knowledge bases and external sources of knowledge over time. With increasing knowledge bases and strategic advancement over time, firms are able to benefit from knowledge transfer.
11	Yun-Chung (2008)	China	Empirical	Yes	Development of indigenous institutions with multinational corporations' research and development (R&D) centers can produce localized windows of opportunity for advanced R&D activities to be conducted outside the USA, Europe, and Japan.
12	Wu (2008)	Taiwan	Empirical	Yes	Organizational conditions, technology adoption, supplier relationship management, and customer relationship management facilitate the knowledge conversion process in order to achieve successful knowledge creation in a supply chain. Results are applicable to other developing countries whose leading businesses are similar to the original equipment manufacturers.
13	May et al. (2005)		Theoretical	Yes	Culturally based approach to transferring knowledge that includes the culture, values, attitudes, and behaviors of Russian managers.
14	Numprasertchai and Poovarawan (2008)	Thailand	Empirical	No	An ICT-based KM system improves university performance in terms of quality of students, research results, and innovative community services.
15	Uma Mageswari et al. (2015b)	India	Empirical	No	Organizational culture and leadership support are shown to have a partial impact on KM, whereas technology has no impact on KM.
16	Adam and Urquhart (2009)	Maldives	Empirical	Yes	The role of cognitive capital is the most important for accumulating structural and relational capital.

(*continued*)

Table 24.1 (continued)

No.	Author and year	Country	Paper type	Mention of context	Key findings and contributions
17	Asrar-ul-Haq and Anwar (2016)	Pakistan	Review	No	There is a gap in the literature on knowledge-sharing practices in developing countries. Extant literature focuses on KM practices and their work-related outcomes, and there is little work on its development, process, and implementation.
18	Payumo et al. (2012)	India, China, Philippines	Empirical	Yes	The instituting of intellectual property management and technology commercialization does not happen on its own—it requires investment and significant institutional changes.
19	Chadee et al. (2011)	India	Empirical	No	Despite the growing significance of outsourcing, research has been conducted mostly from the perspective of outsourcing firms and focusing on the economic implications of outsourcing for developing world economies.
20	Sivakumar and Lourthuraj (2017)	India	Empirical	No	Proposes a conceptual model that integrates KM practices, emotional intelligence, organizational learning, and organizational diagnosis to establish a theoretical link between these constructs.
21	Uma Mageswari et al. (2017)	India	Empirical	No	The Indian manufacturing sector utilizes labor-intensive traditional methods and KM is still at a nascent stage.
22	Al-Sa'di et al. (2017)	Jordan	Empirical	No	KM has significant positive effects on product and process innovations, and on operational performance.
23	Sharma et al. (2016)	India	Empirical	No	KM and global mindset have positive and statistically significant effects on the quality of client–vendor relationships.
24	Bernal-Torres et al. (2016)	Colombia	Empirical	No	Unlike in North America, KM in Colombian enterprises does not emphasize the use of technologies or activities relating to individuals' behavior as sources of competitive advantage.
25	Revilla and Knoppen (2015)	Spain	Empirical	No	Both strategic supply management and trust in buyer–supplier relationships are related to knowledge integration.

(*continued*)

Table 24.1 (continued)

No.	Author and year	Country	Paper type	Mention of context	Key findings and contributions
26	Sook-Ling et al. (2015)	Malaysia	Empirical/ Review	Yes	Proposes an inclusive research model to overcome the single perspective issues of previous research, which looked at KM activity, information technology (IT) applications, or information infrastructure capability (IIC) independently.
27	Özlen (2015)	Bosnia	Empirical	Yes	Results from the Bosnian context show that knowledge sharing practices improve organizational and individual performance by developing a sociotechnical knowledge sharing environment.
28	Bamgboje-Ayodele and Ellis (2015)	Nigeria	Empirical	Yes	National culture can influence the effectiveness of KM strategy. This article studies how Nigerian culture influences organizational culture, which in turn influences KM practices.
29	Uma Mageswari et al. (2015a)	India	Empirical	Yes	Four main knowledge management processes are identified: knowledge acquisition, knowledge creation, knowledge storage, and knowledge sharing.
30	Rao (2013)	India	Empirical	No	Describes in detail the concept of "Unified Government" along with a case study in the Indian context.
31	Fong et al. (2011)	Malaysia	Empirical	No	HR practices showed a positive relationship with knowledge sharing, as perceived by managers in Malaysian organizations.
32	Badamas (2009)	Nigeria, Ethiopia	Theoretical	Yes	Discusses the relationship between information, knowledge, and technology management, with special emphasis on their applications in developing economies.
33	McQuade et al. (2007)	Germany, Ireland, the Netherlands, Portugal, Slovakia	Empirical	Yes	Studies the effect on company knowledge as experienced members retire. Findings include potential loss of technical product and process knowledge and expertise as well as loss of expertise in interpersonal communication skills.
34	Ching-Yaw, Sok, and Sok (2007)	Cambodia	Empirical	No	Studies the elements of training conducted by commercial banks in Cambodia and examines their relationship with training effectiveness.

(*continued*)

Table 24.1 (continued)

No.	Author and year	Country	Paper type	Mention of context	Key findings and contributions
35	Adam and Urquhart (2007)	Maldives	Empirical	Yes	Offers conclusions about the role of national context, social capital, knowledge sharing, and geographical isolation when considering IT capacity building for that sector.
36	Hegde and Shapira (2007)	Malaysia	Empirical	No	Malaysian firms possess relatively high process and organizational innovation capabilities, but lag in new product development.
37	Bozbura (2007)	Turkey	Empirical	No	According to survey results, Turkish SMEs do not share knowledge even within the company. Managers are afraid of losing control of knowledge.
38	Napier (2005)	Vietnam	Empirical	Yes	Long-lasting knowledge transfer must be bi-directional for the primary transfer to succeed, and moves from primarily explicit to both explicit and more tacit knowledge transfer.
39	Numprasertchai and Igel (2004)	Thailand	Empirical	Yes	Presents a research framework for analyzing the role of KM in improving and sustaining research activities in academic research units that led to important product or service innovation in the local market.
40	Lies et al. (2004)	Mauritius	Empirical	Yes	Analyzes the migration or transfer of what is often claimed to be best practice in human resource management (HRM) from Western countries to developing countries with different cultures.
41	Syed-Ikhsan and Fytton (2004)	Malaysia	Empirical	No	Investigates and examines the availability of a knowledge management strategy in a public organization in Malaysia.
42	Liyanage and Poon (2003)	Australia, Hong Kong, Singapore	Empirical	No	Investigates the factors impacting on the design, development, and implementation of technology management learning programs in business schools in Australia, Hong Kong, and Singapore.

[a]Empirical papers include qualitative studies, ethnographies, secondary data analysis, quantitative surveys, and case studies

Findings

Classifications Each of the selected articles was analyzed and coded in light of classifications provided by David and Fahey (2000). We coded them according to knowledge category (human, social, structured) and knowledge type (tacit, explicit). We observed that most of the articles conceptualized KM as the management of structured and explicit knowledge. Figure 24.1 shows that 29 of 42 articles conceptualize knowledge as structured and rooted in organizational systems, routines, and processes, 21 articles use definitions of knowledge that include human knowledge or the knowledge contained in individual members of organizations, while only 15 organizations operationalize knowledge in a way that includes social knowledge or the knowledge that exists in human interactions and communications. Thirty-one articles conceptualize knowledge as explicit, while 17 articles use definitions including tacit knowledge. The analysis includes articles where there are overlaps, such that more than one conceptualization is used.

Publication Trends There is no clear publication trend showing that research in this area is conducted in an arbitrary manner. Figure 24.2 shows the year-wise publication trend from 2000 to 2017. Similarly, the developing countries on which these studies are based are randomly distributed, with the exception of India, where five of these studies are based. Figure 24.3 shows these data.

Contextual Research A major observation was that in most of these articles, there is either no mention of contextual influence on results or just a brief mention of cultural factors that may have impacted the study. The developing

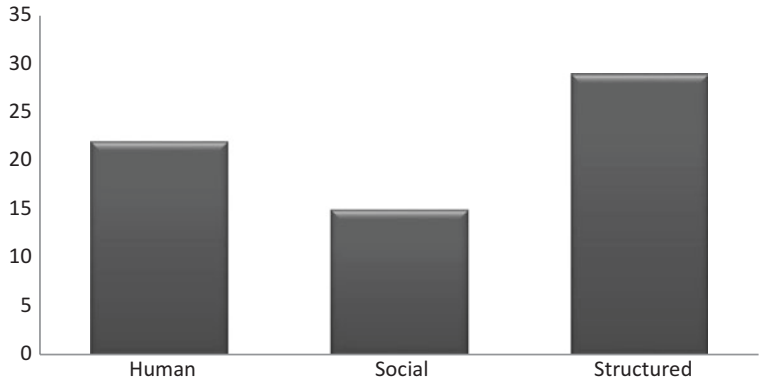

Fig. 24.1 Knowledge category

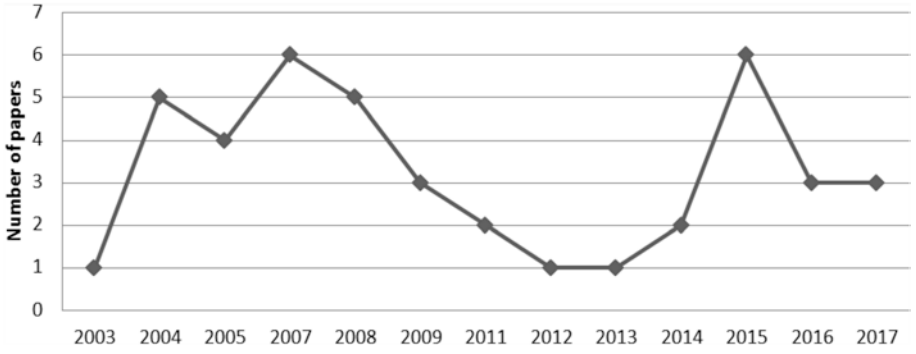

Fig. 24.2 Year-wise publications

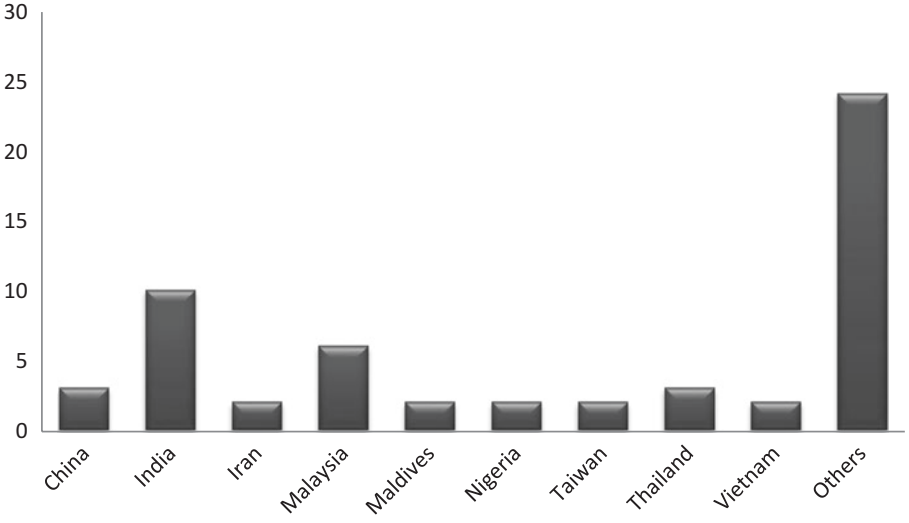

Fig. 24.3 Number of articles per country

country context is only discussed and applied to the interpretation of findings in 18 of the 42 articles. We used these 18 articles for further thematic analysis. Twenty-one articles adopt a deductive research approach, 17 use an inductive approach, and one article uses a combination of both approaches. We identified the research approach of the articles in order to find out what proportion of the articles tested existing Western theories and how many used themes emerging from data to theorize new concepts.

Of the 17 inductively conducted studies, only four articles—Bamgboje-Ayodele and Ellis (2015), Lies et al. (2004), May et al. (2005), and Pio (2005)—discuss contextual influences on KM in detail. Bamgboje-Ayodele

and Ellis (2015) describe the Nigerian context in elaborate detail and present factors that make the Nigerian context different from the contexts where mainstream research is conducted. Similarly, Lies et al. (2004) discuss specificities of the Mauritian context, including cultural norms and attitudes that make cross-cultural knowledge transfer between Mauritian and Western counterparts more complex. May et al. (2005) begin with the premise that Western practitioners find it challenging to transfer knowledge in emerging economies. To assist such practitioners, they provide a culturally based approach to transferring management knowledge to emerging economies such as Russia. They argue that many barriers to knowledge transfer can be attributed to cultural values, attitudes, and behaviors. These values and behaviors are idiosyncratic to their respective cultures and, in the case of developing countries, very different from the values and behaviors that are considered prerequisites for knowledge transfer in mainstream literature. Pio (2005) provides a snapshot of the Eastern pupil–mentor (*guru-shishya)* knowledge sharing tradition and provides examples of how KM in India can differ from that in the West. Few of the other articles provide a culturally embedded discussion that informs our understanding of the developing country context.

Discussion

Extant literature largely focuses on KM practices in relation to various work-related outcomes, such as knowledge creation in inter-firm relationships (Wu 2008), client–vendor relationships (Sharma et al. 2016), innovation and operational performance (Al-Sa'di et al. 2017), customer relationship management (Sanayei 2005), and ICT performance (Cathy et al. 2008). Anwar-ul-Haq and Anwar (2016), in their review of KM literature, observe that most KM studies treat KM as an antecedent to work-related outcomes, while little has been done to theorize about the KM process, KM development mechanisms, and implementation. In this review, we also observed that a large portion of the reviewed articles focus on outcomes of KM.

Using David and Fahey's (2000) categorization, we divided the articles into three strands: structured knowledge, human knowledge, and social knowledge. In connection with the fact that most of the articles are concerned with work-related outcomes, many of them conceptualize knowledge in the form of a structured organizational asset (e.g., Bernal-Torres et al. 2016; Payumo et al. 2012; Li 2004).

The articles in the first strand discuss the mechanisms that enable as well as constrain the creation and sharing of organizational knowledge. Organizational

constraints on the creation and sharing of structured knowledge include resource limitations (Numprasertchai and Igel 2004), organizational culture (Bamgboje-Ayodele and Ellis 2015), and national culture (May et al. 2005). Enablers of the creation and sharing of structured knowledge include IT capacity (Adam and Urquhart 2007), innovation capabilities (Hedge and Shapira, 2007), and presence of institutional mechanism for the facilitation of KM practices (Payumo et al. 2012).

In the second strand, studies in HRM (e.g., Ching-Yaw et al. 2007; Fong et al. 2011; Lies et al. 2004) discuss the issues involved in the effective management, sharing, and distribution of human or cognitive knowledge. HRM-related research on KM is chiefly focused on transfer of training (Ching-Yaw et al. 2007). Research in this tradition refers to lack of trust (Bozbura 2007), lack of focus on innovation and technology (Bamgboje-Ayodele and Ellis 2015), and national and organizational culture (May et al. 2005) as constraints on the sharing of human knowledge. Enablers of the creation and sharing of this form of knowledge include an understanding of national values, attitudes, and behaviors (Pio 2005), succession planning and training (McQuade et al. 2007), and an environment of trust and security (Bozbura 2007).

The third strand of KM that deals with relational or social knowledge was found to be the least researched. One possible reason for this finding is the fact that most of the articles that turned up in our research are empirical in nature, while social knowledge is primarily tacit and therefore hard to capture through deductive reasoning. Only three articles recognizably address social knowledge only: Kale (2009), Revilla and Knoppen (2015), and Wu (2008). Other articles that address social knowledge (e.g., McQuade et al. 2007) do so along with other conceptualizations.

We further analyzed the 18 articles that mention their developing country context and found three recurring themes that are all studied as enablers of or barriers to knowledge creation or sharing. We studied each article in detail and coded the recurring themes as T for trust, P for power, and H for hierarchy. At the end of our analysis, some articles, based on their content, were coded either T, P, or H, while some were coded any combination of two of the three codes. Five of the articles employ all three themes: Bamgboje-Ayodele and Ellis (2015), Lies et al. (2004), May et al. (2005), Napier (2005), and Pio (2005). Trust appears as a theme in 11 of the 18 articles. In some of these studies, trust is mentioned as an enabler of knowledge creation and sharing (e.g., Pio 2005), while in others it is studied as a missing ingredient and thus a barrier to creating and sharing knowledge (e.g., Bamgboje-Ayodele and Ellis 2015; May et al. 2005). Eight of the articles study hierarchy as a contextual element in developing countries. In some of these studies, hierarchy is used

interchangeably with power (e.g., Adam and Urquhart 2007), while in others it is identified as a systematic element that slows down or inhibits communication and consequently the sharing of knowledge (e.g., Kale 2009; Napier 2005). We used these themes to catalog current contextual research on KM in developing countries. Figure 24.4 shows this categorization.

The articles that fall in the T:H category discuss the concepts of centralization and trust together, and discuss how centralized decision making in some developing countries is attributed to lack of trust as a cultural attribute. These papers are mostly concerned with the process of knowledge sharing and its enablers and barriers. Based on these studies, we recommend that future research in this area explores indigenous knowledge sharing mechanisms that are undocumented and not hierarchical. There may exist forms of information or knowledge sharing in these developing contexts about which the current literature is not informed: informal contact with junior staff members,

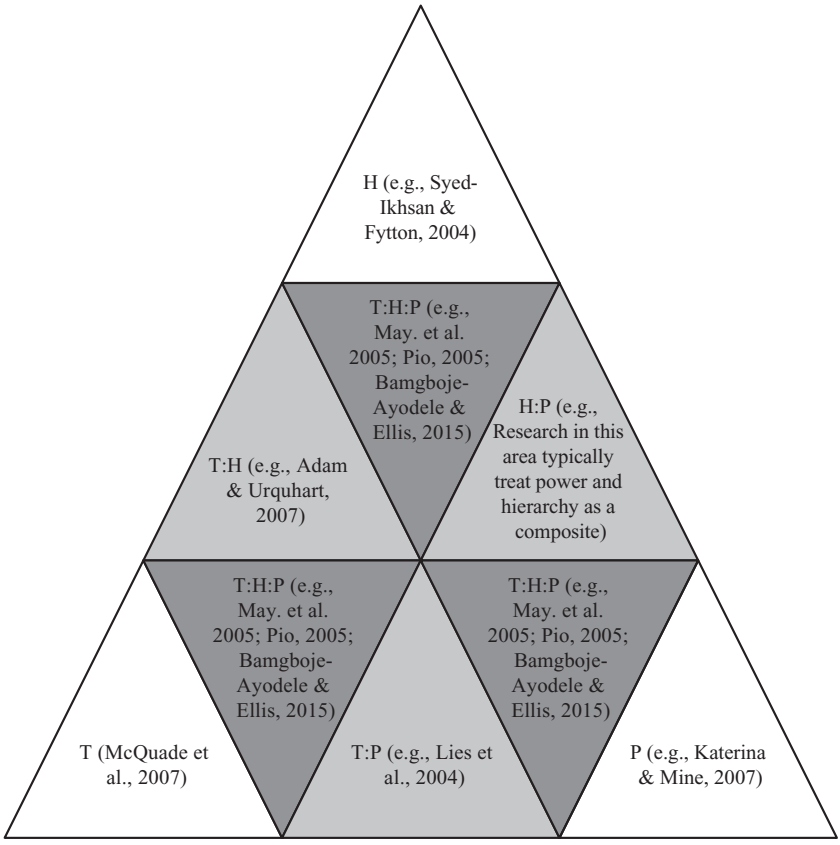

Fig. 24.4 KM in developing countries: categorization of contextual themes

drivers, and security guards, congregational prayers, festivals, and other informal meetings can be sources of knowledge sharing upstream in the hierarchy in these developing countries.

The articles in the T:P category discuss power and trust either as two separate barriers (e.g., Bamgboje-Ayodele and Ellis 2015) or as one composite barrier, such that knowledge is considered a source of power and its sharing is considered as a potential source of insecurity on the part of managers (e.g., Bozbura 2007). We argue that power distance is a distinct cultural characteristic in many developing countries and that it should be considered while studying KM practices in these countries. While from a Western perspective cultural characteristics such as power distance may be considered as barriers to knowledge sharing, more informed and culturally embedded studies, such as Pio (2005), may bring forth interesting and novel means of knowledge sharing. We also argue that while power distance is frequently studied, other aspects of culture such as individualism vs. collectivism, masculinity vs. femininity, uncertainty avoidance, long-term vs. short-term orientation, and indulgence vs. restraint (Hofstede 2011) are not studied in any of the papers in our search. We suggest that future studies in this area need to give more consideration to the cultural dimensions of the developing countries in which their studies are based. More indigenous research needs to be conducted using qualitative investigations that are grounded in contextual realities instead of being heavily influenced by existing literature.

Conclusion

This review chapter presents a snapshot of the research on KM in developing countries that has been conducted in the organization studies domain. Knowledge management and knowledge sharing have been subjects of research for scholars and practitioners across many disciplines for the past two decades. However, many studies (e.g., Asrar-ul-Haq and Anwar 2016; May et al. 2005) have observed that there is a clear dearth of KM research in and about developing countries, and this chapter is an attempt to address this gap.

Based on this review, we conclude that KM research in developing countries is fragmented, such that no clear patterns of research were visible in our analyses. We argue that this fragmentation is due to the fact that most management research conducted in developing countries attempts to legitimize itself by adhering to Western conceptualizations and definitions (Meyer 2006). Little work has been conducted to understand developing country contexts and to come up with indigenous conceptualizations and definitions.

In order to comprehend the different KM mechanisms, and in order for Western practitioners to understand their business counterparts in other parts of the world, there is a need for more contextually embedded, localized work that is conducted inductively.

We also observe that KM research in developing countries is mostly concerned with trust, power, and hierarchy or control, while other aspects of these cultures, such as individualism vs. collectivism, masculinity vs. femininity, uncertainty avoidance, long-term vs. short-term orientation, and indulgence vs. restraint, are not studied. Future research needs to be more culturally informed and contextually embedded in order to bring forth meaningful results. In the light of existing research and findings from this chapter, we suggest that future research should conduct more ethnographic studies and grounded theory research for a fresh understanding of indigenous conceptualizations. A better understanding of cultural values, norms, attitudes, and behaviors can not only inform further research in developing country contexts but can also prove useful to practitioners conducting business with or in these countries. With a large part of both the service and technology industries moving to developing countries, it is imperative for practitioners conducting business in developing countries to be informed about cultural specificities and intricacies and the way they define how business practices are conceptualized and practiced.

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25

Managing Knowledge and Learning for Process Improvement: A Software-Mediated Process Assessment Approach for IT Service Management

Anup Shrestha, Eric Kong, and Aileen Cater-Steel

Introduction

Knowledge and learning capabilities are critical to organisations. Organisations recognise new knowledge before they assimilate and apply it to meet business goals through learning. There is a continuous genesis of new knowledge creation and re-creation where gestalts and logical structures are added or deleted from the knowledge stock of an organisation (Boal and Hooijberg 2000). Such capabilities involve processes used offensively and defensively to improve the fit between an organisation and its changing environment towards knowledge management (KM) (Boal and Hooijberg 2000). In short, organisations are more likely to build on previous knowledge and generate new knowledge if they embrace a high level of knowledge and learning capabilities (Crossan and Apaydin 2010).

The increasing popularity of information technology service management (ITSM) as a discipline that manages delivery of IT services to organisations is accompanied by an abundance of KM systems to support ITSM processes; for example, the incident management process may be supported by service desk tools that store knowledge of best practices. These KM systems are intended to support the execution of ITSM processes; however, few tools appear to be available to improve ITSM processes. In this space, the ITSM sector is facing

A. Shrestha (✉) • E. Kong • A. Cater-Steel
School of Management & Enterprise, Faculty of Business, Education, Law and Arts, University of Southern Queensland, Toowoomba, QLD, Australia

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a number of challenges. The demand for process improvements in IT services has grown considerably. This means that IT service organisations will need to ensure that their knowledge and learning are frequently updated. This chapter is therefore a timely study as it extends the literature by introducing a new approach, that of a KM process cycle that adds value to the ITSM sector.

The chapter is organised as follows. First it presents a discussion of knowledge and learning processes in general as well as process improvement in the context of the ITSM sector. This is followed by an overview of the software-mediated process assessment (SMPA) approach and its four phases. A discussion of three practical strategies for using the SMPA approach is then presented. This includes the introduction of a KM process cycle within the SMPA approach in the ITSM sector. A discussion of the SMPA key value propositions is then provided. The conclusion, as well as limitations and avenues for future research, are included in the final section.

Knowledge and Learning Process

Knowledge is commonly categorised as tacit or explicit. Tacit knowledge is highly subjective and dependent on the experiences and skills of an individual, while explicit knowledge is objective and relatively easy to articulate and share and thus is not bound to persons (Schimpf 2015, p. 52). Knowledge, notably tacit knowledge, has been recognised as a critical firm resource that fits the resource-based view (RBV) criteria of rare, valuable, costly to imitate and non-substitutable (Barney 1991; Wernerfelt 1995), and therefore has the potential to contribute significantly to organisational competitive advantage (Pertusa-Ortega et al. 2010). Organisational value, whether financial or non-financial, is mostly created by the competent members of an organisation who 'know what', 'know how', 'know why' and 'care why'. Such competent members can include anyone from the top to the bottom levels of the organisation (Quinn et al. 1996). An organisation's ability to innovate, create and use the entrepreneurial energies of its people becomes critical in the knowledge economy (Bhatnagar 2006).

Knowledge has become a central theme in the strategic management literature because it is a critical source of sustained competitive advantage (Newman 1997). Organisations that are able to utilise their tacit and firm-specific knowledge effectively are more likely to coordinate and combine their traditional resources and capabilities in innovative and distinctive ways, providing more value for their customers than their competitors (Wang et al. 2009). However, knowledge can quickly become redundant and lose its relevance if it is not frequently updated and refreshed (i.e. learn, unlearn and re-learn)

(Becker 2010). Thus, managing critical learning processes is as important as, if not more important than, managing critical knowledge in organisations.

Learning acts as a dynamic element in knowledge transfer and creation and helps to augment the knowledge stock of an organisation while keeping its knowledge stock up to date and relevant (Kong et al. 2013). Learning first takes place at the individual level and then can be extended to the group and organisational levels (Aakhus 2007). Individuals learn from the application of knowledge in a process and then share these learnings with other organisational members through interaction, practice and documentation (Massingham and Holaibi 2017). These three levels of learning result in changes in 'know what', 'know how', 'know why' and 'care why', allowing the individual to learn from their existing knowledge, then reflect in practice, and subsequently to generate new knowledge for applying it to a work situation (Garud 1997).

For maximum results, learning processes need to be aligned with one another in a coherent way so that knowledge, both tacit and explicit, that is embedded in processes, products, culture, routines, artefacts or structures can support the strategic orientation of an organisation (d'Armagnac 2015). Organisations that are able to create knowledge on an ongoing basis are more likely to develop dynamic and unique capabilities that potentially underpin continuous organisational learning (Tsoukas and Mylonopoulos 2004). These capabilities can be defined as knowledge and learning capabilities (Kong et al. 2013). These capabilities are distributed throughout an organisation and thus can occur at individual, group and organisational levels (Kong et al. 2013). In this chapter, knowledge and learning processes are managed for process improvement in the ITSM sector using a novel approach that measures the process capability of ITSM processes. Once the capability level of a process is determined, it provides a benchmark 'As-Is' view of the process so that an improvement plan can be devised to get to the 'To-Be', improved stage of the process. The next section discusses the rationale of building such a new approach based on knowledge and learning principles to facilitate process improvement.

Managing Knowledge and Learning for Process Improvement in IT Service Organisations

Knowledge management can be defined as the process of capturing, distributing and effectively using knowledge in a way that attempts to enhance learning and improve organisational performance (Kongpichayanond 2009). It is

widely accepted that KM may be used in process management in today's business environment (see, e.g., Massingham and Holaibi 2017). Harkness et al. (1996) argue that the aim of process management is organisational transformation resulting in sustained process improvement. Process improvement is usually the outcome of new knowledge arising out of research and development activities surrounding existing process activities driven by organisational members (Harkness et al. 1996). For the purposes of this research, process improvement refers to the ability of firms to offer better IT services and processes which increase the overall profitability and competitiveness of firms. Process improvement is essential for firms to survive in today's hypercompetitive global environment (Massingham and Holaibi 2017). It has also been found to be strongly correlated with business performance and innovation (Harkness et al. 1996). KM and learning contribute to process improvement through systems, technologies and tools and allows learning processes to occur and knowledge to be created, captured, stored and shared in order to benefit an organisation (Becerra-Fernandez and Sabherwal 2015). While process improvement methodologies are essential, knowledge creation and learning processes will not spontaneously occur unless organisations possess superior execution of the human tasks of sensing, judging, creating and building relationships (Ireland and Hitt 1999). These human tasks involve frequent transfers of tacit and explicit knowledge (Nonaka et al. 2008). Organisations must manage these knowledge and learning activities and process improvement methodologies hand in hand and effectively, as they hold the key for innovation and strategic renewal (Bontis and Serenko 2007).

As previously discussed, the ITSM sector is facing a number of challenges including rapid technological change, declining product life cycles, evolving business environments and increasingly burdensome global regulation (Deloitte 2017; Wong 2014). Business users rely upon services provided by their IT departments and providers to accomplish their tasks—from routine operational activities to mission-critical strategic undertakings. The quality of IT services has therefore become an increasingly important issue in today's business environment, where digital innovation continues to transform business models and strategies across all industries. Examining both customer-facing and internal processes involved in IT service design and delivery can provide significant metrics to determine business value and innovation driven by IT services. However, there is a lack of a unified model for service innovation to evaluate the quality of service outcomes and service process improvement (Chesbrough and Spohrer 2006). Consequently, limited process measurement initiatives are reported in the literature and industry in the ITSM sector.

To deliver high-value IT services to businesses, the ITSM sector has defined a number of processes as best practices, for example, the widely applied IT Infrastructure Library (ITIL®) framework (TSO 2011) and the international standard for ITSM, ISO/IEC 20000 (ISO/IEC 2011a). ITIL and ISO/IEC 20000 adopt the process approach principle of quality management in order to manage activities as processes. Service-oriented technology innovations have also evolved from multidisciplinary areas such as computer science, marketing, supply chain management and KM, leading to the concept of service science, management and engineering (Bardhan et al. 2010). Undoubtedly IT can deliver value-adding services for organisations to be more innovative and adaptive by implementing best practice processes.

Recent research recognises that process management and KM should be unified and knowledge should be embedded in business processes (see, e.g., Massingham and Holaibi 2017). However, Massingham and Holaibi do not address how an organisation evaluates process improvement and do not have a clear focus on learning as a key element in knowledge transfer and creation, particularly within an information systems context. As highlighted before, organisations are more likely to build on existing knowledge and generate new knowledge if they embrace the potential of learning and leverage knowledge for innovation. Process improvement programs may be difficult to sustain and may even regress over time if they are not effectively managed (Juran and Godfrey 1999). This is because knowledge needs to be constantly updated and refreshed to ensure it is relevant for the IT service organisations (Becker 2010). Many IT service organisations have adopted process assessment techniques that call for a systematic measurement of processes. The measurement results are then used to continually improve the processes. Conversely, it is reported that process assessments are costly and time consuming (Fayad and Laitinen 1997). In addition, assessment outcomes are often dictated by proprietary methods and tools employed by assessors from consulting firms. ITSM process assessments need to be transparent in order to ensure confidence in the assessment process and outcomes.

Existing ITSM process assessment approaches, such as Tudor IT Process Assessment (TIPA) (Barafort et al. 2009) and ITIL Process Maturity Framework (Rudd and Sansbury 2013), use proprietary process assessment models to assess compliance against the ITIL framework. Even though ITIL provides best practice guidelines to conduct process assessments, it is not designed as a unit of measurement for process assessments. Moreover, there is ambiguity in different assessment methods due to the lack of a transparent assessment method.

In this chapter, we present the software-mediated process assessment approach within the view of a KM process cycle. This approach is proposed to determine the capability of the ITSM processes. Once the current capability of the ITSM processes is determined, process improvement activities can be decided to progress towards the next capability level. Such process improvement guidelines are based on the ITIL framework and comprise process knowledge in order to improve IT services. Relevant process stakeholders (e.g., process managers and performers) can use explicit knowledge about process improvement that is captured as part of the SMPA approach to learn how to improve their processes. Consequently, improvements in ITSM processes is expected to enhance IT services (Barafort et al. 2009). We present the concept of the SMPA approach next and then discuss three practical strategies that IT organisations can adopt in order to conduct regular process assessments to facilitate process improvements and enhance organisational knowledge to improve IT services.

The Software-Mediated Process Assessment Approach

The SMPA is an innovative approach that IT organisations can use to transparently self-assess their processes using a decision support system (DSS). The SMPA approach determines process capability based on the international standard for process assessment ISO/IEC 15504 (ISO/IEC 2004), and generates a report with recommendations that guide improvement of ITSM processes. The four phases of the SMPA approach to conduct ITSM assessments are: (1) preparation, (2) survey, (3) measurement and (4) improvement. A rigorous academic process was applied for theoretical validation and methodological guidance during the development of the SMPA approach. The ISO/IEC 15504 standard (currently revised into the ISO/IEC 33000 standard series) and the associated assessment models provided support for a transparent method. A cloud-based DSS was implemented to demonstrate efficient operation of the SMPA approach. The SMPA approach also used the ITIL best practice guidelines to develop a knowledge base for process knowledge recommendations. After several iterations of development cycles, the SMPA approach was evaluated at two IT service providers in Australia. Changes were incorporated based on the evaluation and another round of evaluation was conducted at a global financial services provider headquartered in the USA.

Using the SMPA approach, organisations can focus on process improvement efforts rather than being concerned about the method, validity and cost of repeated process assessments. The architecture of the SMPA approach is illustrated in Fig. 25.1. A detailed discussion of the four phases of the SMPA follows.

Process Selection Method

In the SMPA approach, the principles of the Balanced Scorecard (Kaplan and Norton 1992) are used to prioritise the business drivers of the organisation unit being assessed. Since business drivers are implicitly linked to the ITSM processes, prioritising the business drivers identifies the current ITSM processes that are of greatest value to the organisation. Likewise, the SERVQUAL model (Parasuraman et al. 1985) is used to investigate the perceptions of the process stakeholders regarding the service gap, that is, which processes are in need of improvement. The DSS compiles a prioritised list of ITSM processes based on the current business drivers and stakeholders' perceptions of the service gap. The scope of the process assessment can be determined by selecting the ITSM processes that are most important to business and also endorsed by the relevant stakeholders.

Online Survey

While the existing ITSM process assessments rely on the manual collection of process-specific indicators that demonstrate objective evidence, the SMPA approach facilitates a top-down approach where each ITSM process is defined with a goal. Subsequently, the assessment is guided by explicit questions that are set to determine goal attainment using online surveys. The structure of the survey questionnaire is guided by the Goal-Question-Metric (GQM) approach (Basili et al. 2002). Following the GQM approach, assessment questions for the survey were generated by analysing assessment indicators using a standard process assessment model to construct singular, fine-grained and closed-ended assessment questions.

Measurement

The assessment questions were grouped to determine process capability levels from 1 to 5 and every question was designed to have consistent answer

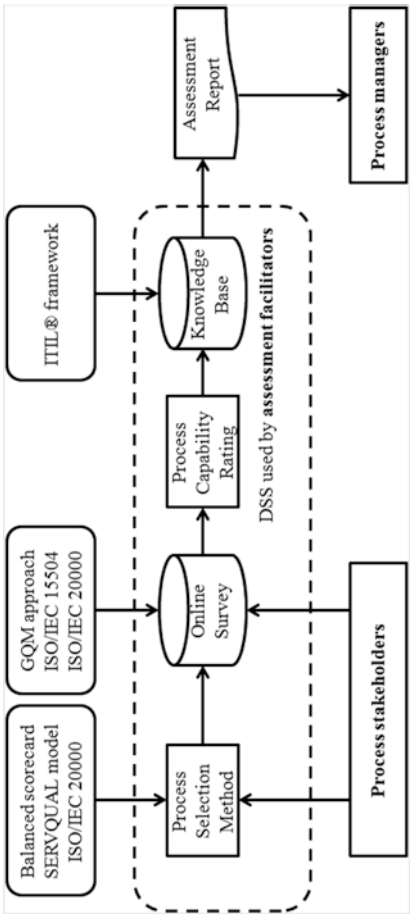

Fig. 25.1 The SMPA architecture (Shrestha 2015)

options using the rating scale *Not*, *Partially*, *Largely* and *Fully* as defined in the standard measurement framework (part 2 of the ISO/IEC 15504 standard). According to the standard, a particular capability level can be achieved if: (1) the attributes of the target level are fully or largely achieved; and (2) the lower-level attributes are fully achieved. For each assessment, the DSS determined the process capability score by calculating the arithmetic mean value of all the responses using the scale percentage based on the standard measurement framework. The coefficient of variation was also computed for each capability score to report reliability in terms of the spread of responses.

Improvement

Knowledge items were generated for all assessment questions based on the ITIL framework and stored in a knowledge database in the DSS tool. The ITIL framework is a widely accepted resource for IT service providers who seek guidance on process improvement (Barafort et al. 2009). A knowledge item for each question is extracted from the knowledge base and compiled in the assessment report when the process demonstrates risks due to low process capability scores. For every assessment question, two components—observation and recommendation—are combined to generate a process improvement knowledge item. The observation component of a knowledge item lists the current state of the process capability. Likewise, the recommendation component of a knowledge item is based on the ITIL guidelines to achieve higher capability levels. Detailed information on the development and use of the SMPA approach have been previously reported (Shrestha et al. 2016).

The opportunities provided by the SMPA approach can be translated into significant cost savings and reliability by avoiding or minimising the use of costly assessors and consultants, and at the same time enabling self-assessment to develop valuable process knowledge in the IT organisation. Next, we offer three practical strategies that we compile from our experiences with the use of the SMPA approach. We believe any IT organisation can adopt these strategies to conduct repeatable process assessments in order to highlight process risks requiring remedial action, and to make progress in their process improvement goals and KM initiatives.

Evaluation of the SMPA Approach

Evaluation of the SMPA approach was organised based on the evaluation strategy advocated by Pries-Heje et al. (2008). In order to assess whether the SMPA approach has utility in a real organisation, it was essential to ensure that the approach was useable. Therefore, useability was determined to be the key evaluation factor. The concept of useability as defined in the ISO/IEC 25010 software quality in use model (ISO/IEC 2011b) was applied to evaluate five quality factors of the DSS tool: effectiveness, efficiency, usefulness, trust and comfort.

Overall the DSS users reported that they found the SMPA approach easy to follow and agreed that a self-assessment experience answering direct questions made the process assessment transparent and economical to implement. Moreover, a tiered approach was recommended, wherein the SMPA approach could be used first in order to obtain overall knowledge of process capabilities. Afterwards, in order to engage in process improvement, DSS users suggested that human judgement is necessary for assessment validation and improvement based on results. The SMPA approach has been revised based on feedback from two rounds of evaluations in Australia and a third comprehensive evaluation at a financial services organisation in the USA. The current evaluation is specific to the SMPA approach and its useability. The concept of a KM process cycle presented in this chapter is argued based on extant literature of KM and the experience of using the SMPA approach for process improvements in the ITSM sector. The KM process cycle (see Fig. 25.2) requires further validation based on empirical data—an area of future research.

Practical Strategies for Using the SMPA Approach

Adoption of International Quality Management Standards

International standards harmonise technical specifications of products and services by offering transparent benchmarks. Even though standards provide authoritative statements of good professional practice, such statements are general principles rather than details of specific activities. The generic role of the international standards also promotes transparency in the way activities are undertaken.

The SMPA approach is scaffolded by the principles of international standards in order to support and validate the prescribed activities. The SMPA

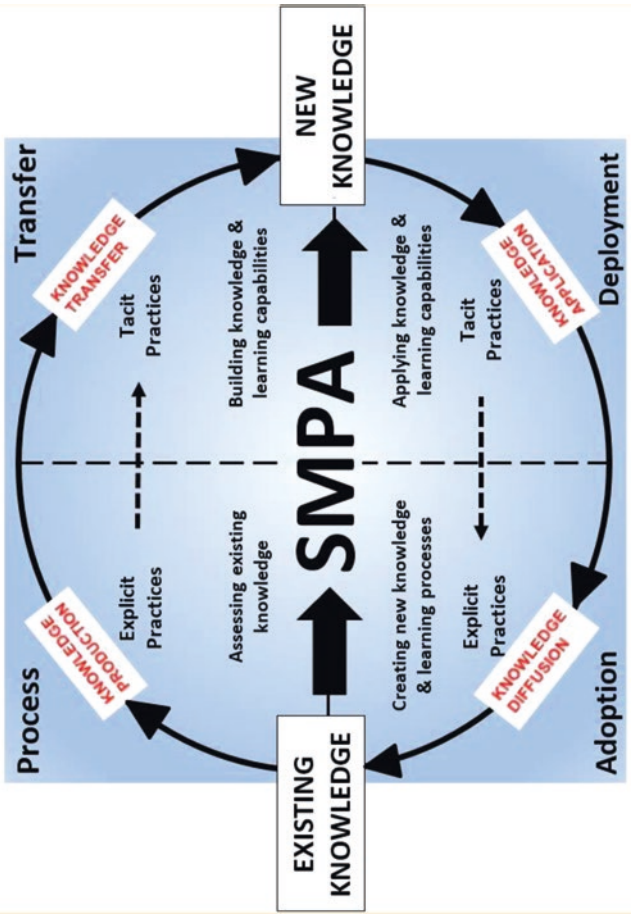

Fig. 25.2 KM process cycle (adapted from Kapeleris 2010)

approach uses standard process indicators for assessment. The international standards for ITSM and process assessment are incorporated in the SMPA approach to facilitate transparency in the way process assessments are conducted. The ISO/IEC 15504 standard mandates the requirement of a documented assessment process that helps to determine the workflow for ITSM process assessments. Following this standard, the SMPA approach provides a transparent method to conduct assessments. The use of the international standards in the process assessments promotes quality improvement and transparency.

Use of a Decision Support System Tool

Although traditionally associated with strategic decision making for managers (Alter 1980), DSS has now become a general term for any computer information system that supports decision-making activities of individuals and groups (Power et al. 2011). Beyond the 'data focus' in electronic data processing systems or the 'information focus' in management information systems, a DSS has a 'decision focus', thus representing a more mature form of information systems to assist users (Sprague 1980).

DSS enables specialised problem-solving based on the knowledge about a particular domain (Power et al. 2011). The DSS for process assessments can store knowledge items of process improvements based on the ITIL framework. The technological rules relate to the process assessment activities as defined in the standard. The DSS enables understanding of problems since low process capability scores represent process risks. Using the DSS, process managers receive help in decision making to solve the problems and commence process improvement initiatives.

The DSS automates the SMPA phases by assisting in the collection of assessment data and generation of the assessment report. Therefore, an assessment facilitator is not required to have expertise in the domain of process assessment or ITIL in order to facilitate the SMPA approach. The assessment data collection and validation, rating of the process capability and reporting of the assessment results require that assessment information is gathered, aggregated, evaluated and presented. The DSS can store and analyse datasets from several iterations of targeted stakeholder responses to assessment questions. In this way data analysis can be low cost and can happen in real time for each assessment.

The SMPA approach can represent the assessment results from the entire population of process stakeholders. With an online survey interface, the

SMPA approach can query and capture responses from process participants regardless of geography. Use of online surveys in psychological studies has been linked with efficiency due to automation that also enables expansion of the scale and scope of such studies (Kraut et al. 2004).

With the DSS, assessment responses can also be verified and analysed. The DSS can support an enhanced ability to track assessment participation and provide granular process improvement recommendations. Likewise, the ability to store historical data on process performance means that the SMPA approach is ideal for repetitive self-assessments and for benchmarking.

When a DSS tool is used to facilitate the entire process assessment, the assessment exercise is inexpensive and somewhat invariant to the number of assessments conducted. Moreover, the use of a DSS tool for process assessments promotes a paradigm shift, as rigorous process assessments become accessible for small and medium-sized IT organisations. This concept promotes an entirely new business model where process assessments are offered as a service via a cloud-based platform. Such a business model is an example of digital innovation that can potentially transform strategies for process improvements in the ITSM sector.

Development of KM Process Cycle

As previous discussed, process improvement is critical for the survival of IT service organisations in today's competitive global environment. KM and learning processes can contribute to process improvement through systems, technologies and tools, but the KM process must embrace a consideration of tacit and explicit knowledge exchange to ensure that knowledge creation and transfer arise concurrently during process improvement for maximum effect in the ITSM sector. A KM process cycle relevant to the SMPA approach is highlighted in Fig. 25.2.

The SMPA approach can facilitate the KM process cycle, particularly in terms of knowledge transfer. As shown in Fig. 25.2, the SMPA approach allows reliable assessment data to be collected as existing knowledge through online surveys and then transferred to the DSS for knowledge production. Subsequently, relevant process improvement recommendations are generated from best practices and provided in an assessment report. This report helps to create new knowledge as well as enhance tacit knowledge for process stakeholders to improve their existing practices.

The SMPA approach extends prior guidelines on ITSM process assessment by providing a fine-grained method to determine capability of ITSM processes.

This research also demonstrated how the SMPA approach is applied in practice by enabling IT organisations to self-assess the capability of their ITSM processes. The SMPA approach facilitates the KM process view as shown in Fig. 25.2 in four areas: (1) *knowledge transfer* by assessing existing knowledge on ITSM process capabilities; (2) *knowledge production* by building knowledge and learning capabilities based on the process improvement guidelines for IT services from the ITIL framework; (3) *knowledge application* by enabling process stakeholders to apply knowledge and learning capabilities for process improvement initiatives; and (4) *knowledge diffusion* by creating new knowledge and learning processes based on the experiences of previous process assessment and improvement exercises.

The KM process view is represented as a cycle, suggesting that it is iterative, as the SMPA approach facilitated repeated assessments in an IT organisation. The new knowledge and tacit practices, once learned, internalised and applied by the process stakeholders, help to facilitate a transfer of tacit knowledge and practices into explicit knowledge and practices to improve IT services. This process KM cycle validates the role of ongoing process assessments for knowledge creation and transfer in the ITSM sector.

SMPA Value Propositions

The SMPA approach is presented as a digital innovation with a new business model to conduct process assessment as a service in order to transform strategies to improve ITSM processes. We now discuss the four key value propositions it offers over the existing manual assessment methods.

Assessment Data Collection

Using online surveys facilitates the collection of quality assessment data thereby promoting transparency. When staff respond to online surveys for process assessment, the responsibility to provide information about process capability is directly allocated to the people in the relevant roles. This approach can eliminate any potential assessor bias, information manipulation or subjective judgements on process capability that can occur when external assessors conduct manual assessment interviews.

Online surveys are ideally suited to remote data collection from a global IT workforce as compared with document reviews or face-to-face interviews. The growth of outsourcing of IT service functions and the use of virtual global IT

teams means that online surveys can be a suitable assessment tool to perform ITSM process assessments, allowing synchronous participation from staff at distributed locations. Broader participation yields comprehensive coverage of assessment feedback that is difficult to obtain in manual assessments.

Assessment Data Analysis

Rather than the assessment team making a subjective choice of the indicator ratings, the SMPA approach analyses feedback directly from the process stakeholders. The automatic storage of collected information also provides an opportunity for validated data to be used to compare process assessment results for benchmarking and demonstration of process improvement. This is important as currently aggregated analysis could not be easily carried out with the existing manual process assessment methods. While there are software tools available for assessors to input assessment data, to our knowledge, no tools currently exist in the ITSM sector that can capture and analyse information directly from the stakeholders for process assessment.

Besides reaching a wide cross-section of process stakeholders, the SMPA approach can also capture the depth of responses, since online surveys enable process stakeholders to provide granular and detailed feedback. The online survey responses can be grouped according to different process roles, thereby enabling analysis of scenarios such as when process managers provide a skewed opinion of the process being performed in contrast with the views of process performers. Such readings can help managers perform gap analysis and understand deficiencies in the process activities. These types of analyses are feasible to solicit from online surveys but would not be easy to realise from assessment interviews.

Consistency in Assessment Iterations

Manually entering data and the subjective judgement in process assessments prevalent in the IT industry can be error-prone and require extensive effort from the assessment team. Consequently, the entire process assessment method can become inconsistent and costly. This means that repeated manual process assessments may not be feasible for organisations. The utility of the SMPA approach is in determining process capability without fear or favour, and in efficient information processing of assessment data. This leads to consistency and speed in the entire assessment cycle that can subsequently lead to faster process improvement and continual service improvement in the ITSM

sector. With the use of the online survey for assessment data collection and the knowledge base to compile the process improvement report as discussed earlier, the SMPA approach automates the entire assessment cycle and subsequent iterations that can eliminate latency for process improvement efforts.

KM and Learning for Process Improvements

Without a DSS, the compilation of an assessment report with process improvement recommendations would require an assessment team with multidisciplinary skills and expertise in process assessment and ITSM, working for a considerable period of time to compile relevant recommendations. The DSS can efficiently produce a report drawing upon expert knowledge of process improvements from its knowledge base. The assessment report represents expert knowledge of ITSM best practices for knowledge transfer, thereby facilitating learning and process improvements.

The DSS provides a novel platform for KM and learning for process improvements in the ITSM sector. The capability of a process comprises indicators that determine process performance, process management, process standardisation, process measurement and process optimisation as staged maturity levels (ISO/IEC 2004). During the assessment exercise, data collection and validation, process capability ratings and reporting of the assessment results require gathering, aggregating, evaluating and finally presenting knowledge for application and learning. Evaluation of the SMPA approach revealed its significance for organisational learning. Using the DSS to survey process stakeholders about the process performance and management will, for example, facilitate residual learning as the survey participants go through a series of questions that exhibit best practice guidelines for process improvement.

The SMPA approach can be useful in the area of adaptive learning for KM in IT organisations. The capacity to continuously improve processes is a useful value proposition for learning and adapting based on past inefficiencies (Murray & Chapman 2003). While many IT organisations have used the ITIL framework for IT service management, the implementation of the ITIL framework is challenging and improvements based on the ITIL framework are difficult to measure. Process improvements can be undertaken in the ITSM community using a number of knowledge transfer strategies, for example ITSM training, in order to progressively implement the ITIL framework while following the path of continual service improvement. In this scenario, the SMPA approach can be used as a learning and training tool in order to convey the necessary process knowledge to all concerned process stakeholders.

Conclusion

This chapter has reported the KM process cycle and demonstrated its application by highlighting the development and evaluation of the SMPA approach.

The research presents contributions for both theory and practice. From a theoretical perspective, this chapter proposes a KM process cycle for process improvements. Process improvements in the ITSM sector are usually carried out at progressive linear levels, for example, capability levels 0 to 5 in the process assessment standard (ISO/IEC 2004). While such an improvement path may be suitable for a process-specific view, a link between such process improvement and the overall continual service improvement cannot be determined. The KM process cycle presents an iterative concept of knowledge creation, transfer, application and diffusion. The process cycle aligns with the continual service improvement philosophy espoused in the ITSM sector.

In practice, continual process improvements can be facilitated by the SMPA approach. The SMPA approach can be mapped to the KM process cycle thereby promoting process improvements that lead to IT service improvement. When senior IT managers are faced with the challenge of improving processes, they tend to struggle with decision making on process improvements due to the lack of specific guidelines—a typical business-agency problem. The SMPA approach proposes a solution to this challenge by facilitating process assessments in a transparent and efficient manner so that management processes and ultimately IT services can gradually be improved.

The SMPA approach to the KM process cycle has implications for the broader IT industry in terms of strengthening business–IT alignment. Repeated use of the SMPA approach promotes consistent measurement of process capability that enables continuous improvement of IT services and the generation of new and valuable tacit knowledge in organisations. Beyond the discipline of ITSM, the SMPA approach can potentially be applied to other domains, for example, IT governance and risk management. With the expanding significance and reach of the ISO/IEC 15504 standard and its evolution into the ISO/IEC 330xx standard series, the SMPA approach is also expected to be the foundation of digital innovation for process assessment as a service in other disciplines beyond ITSM.

This chapter has discussed the application of an IT solution, that is, the SMPA approach for process improvement applied in the context of ITSM organisations. The KM process cycle has implications for ITSM process improvement and learning. However, more research is needed in order to gain a better understanding of the tacit and explicit knowledge exchange within

the SMPA approach in different contexts. With the extended use and wider evaluation of the SMPA approach, the value of this approach to KM and learning can be ascertained.

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26

Best Practices in Knowledge Management: A Review of Contemporary Approaches in a Globalised World

Geoffrey R. Chapman and Stephanie A. Macht

Introduction

The term 'best practice' is used widely in nearly every field of academic study, and purported best practices exist for every type of organisation, including public organisations, private organisations, not-for-profit companies, manufacturing firms, service-based firms, multinational corporations and small to medium-sized enterprises. The origin of the concept is not easy to establish, although the work of Schonberger (1986), which focused on developing world-class manufacturing techniques, is often cited as a fundamental basis for what came to be known as best practice. However, despite the omnipresence of the term over the past 30 years, there is surprisingly little agreement around what actually constitutes a best practice, and there is even less consensus around how beneficial it is for firms to implement changes to their organisational policies to better reflect the best practices of their industry (Castro and Frazzon 2017; Darbyshire et al. 1999; Peters and Heron 1993).

However, this lack of consensus in definition and application have not resulted in a shortfall of research articles, handbooks, textbooks, industry reports and other forms of information that purport to outline the definitive set of best practices for any given field—knowledge management (KM) being

G. R. Chapman (✉) • S. A. Macht
School of Business and Law, CQ University, Australia,
Sydney, NSW, Australia

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no exception (Armstrong and Taylor 2014; Holsapple 2013; McIver et al. 2013; Oliva 2014). The sheer volume of material available creates a situation where best practices in KM appear to be everywhere, but are simultaneously very difficult to actually find. Managers are faced with a task somewhat akin to finding objects in a picture that is out of focus: you can see that they are there, but identifying them clearly is a significant challenge. This chapter attempts to bring that picture into sharper focus by delving into the ample information available on best practices in KM, and by examining some of the tools and initiatives used by organisations around the world. By providing this perspective, the chapter aims to establish what the currently held beliefs are regarding best practice in KM in the contemporary business world. To begin, the chapter considers two key perspectives on KM itself.

Knowledge Management as a Competency

A key element of successful KM within organisations lies with the skills and competencies of the employees. As KM practices need to be carried out by people, it is vital that the people responsible for translating KM policy into effective KM practices have the ability to do so. In a comprehensive review of competencies that organisations should attempt to cultivate and maintain in a consistent manner throughout their organisation, Cohen (2015) highlights KM as a crucial skill, especially for senior employees. Falling under the broader category of 'critical evaluation', KM as a competency enables employees to interpret business information more appropriately, and make optimal decisions and recommendations.

Accordingly, then, rather than simply looking for best practices of knowledge management itself, benefit can be achieved by examining human resource (HR) practices within organisations that result in the development and maintenance of KM-based competencies within the workplace. While it is well outside the scope of this chapter to provide a complete review of all theories and models relating to the optimisation of HR practices, there are a few key concepts that can be highlighted in the specific context of KM.

Boxall and Macky (2009) discuss how a high-performance work system (HPWS) can assist with the process of cultivating desired competencies among employees. They argue that the fundamental element of any HPWS is a high level of involvement by employees, and a high level of commitment from managers. Therefore, applying this to the notion of building KM competency within a workforce results in two fundamental approaches to developing successful KM practices within organisations. The first is to ensure that

all employees have the opportunity to become involved at all levels of KM policy and practice. This can be done in a variety of ways, such as by giving employees a voice in KM policy decisions, or by distributing responsibility for KM practices down through the levels of hierarchy within the organisation. The second is for management to make it a priority to demonstrate a high level of commitment to developing and maintaining KM competencies. This emphasis on KM needs to start at the very top, as senior management commitment to a particular element has a powerful influence over middle management priorities.

Firms stand to benefit in numerous other ways when KM is viewed as a competency and specific actions are taken to develop this competency across the company. However, determining the best specific actions to take is a complicated process, and one that is unlikely to have a universal answer. Companies need to take into account the various elements of their own business that make them distinct from their competitors, and ensure that the actions they take are suitable to their own strategic direction. For example, a company with a strategic priority of innovation would focus on different KM building activities when compared with a company that has a stronger strategic focus on supply chain optimisation. This example is detailed further in the sections below.

Knowledge Management and Innovation

Given the knowledge-intensive nature of innovation, it seems clear that there will be some correlation between higher levels of KM capability and higher levels of innovation within an organisation. Interestingly, however, this correlation extends beyond just the creativity inherent in the firm itself. Martinez-Conesa et al. (2017) present a study that demonstrates the direct influence of KM capability on the levels of open innovation within companies. This finding suggests that higher levels of KM not only improve innovative thinking within a firm, but also allow for greater leveraging of the ideas that exist in the firm's external environment.

Companies with a strategic priority of building both closed and open innovation can therefore achieve this by taking specific actions to build the KM competency of their employees. Shpakova et al. (2017) discuss some of these specific actions, emphasising the role that gamification can play in the development of KM capability. As there are social elements of both KM and innovation, it stands to reason that the social aspects built into the gamification process would make it an effective way to simultaneously develop KM

capability and subsequently innovation within a firm. Some specific gamification techniques that may be useful include:

- a points system that rewards employees for KM-related activities, such as sharing new ideas, developing new uses for existing ideas or facilitating team-based training programmes. In this kind of system, points could be used to improve employees' status within the company, or be redeemed for rewards (or a combination of both);
- a badge system that awards particular badges to employees for KM-related achievements, in a similar manner to the points system above. The key difference with the badge system is the ability to use these visual representations as a knowledge map of the company, to identify particular strengths as well as areas that need improvement;
- as a supplement to either of the above, highly visible elements such as progress bars or leaderboards could be used to foster competition and peer pressure among employees.

Shpakova et al. (2017) suggest that any one of these elements on their own is unlikely to have any significant impact on KM capability or levels of innovation; however, a carefully considered combination of the elements which are most appropriate for the firm's specific circumstances is far more likely to yield positive results.

Knowledge Management and Supply Chain Optimisation

While the practices discussed above could likely be applied within most organisations to produce organisational benefits, they are clearly practices that provide a greater benefit to organisations with a strategic focus on innovation and creativity. However, many organisations, particularly those in the manufacturing sector, have a stronger strategic focus on organisational efficiency and supply chain optimisation. Therefore, the manner in which KM capability is fostered within the company should take into account the different priorities that firms from different industries may have.

Smith (2001) outlines the two types of knowledge within firms: explicit knowledge, which relates more to information that is easily recorded and transferred; and tacit knowledge, which generally relates more to processes and is not as easily recorded or transferred. In the previous section on innovation, much of the knowledge being discussed was of a more explicit nature, which allows for activities such as gamification to be effective. However, when

it comes to supply chain optimisation, Schoenherr et al. (2014) suggest that tacit knowledge has a significantly greater influence than explicit knowledge.

Accordingly, for firms with a strategic focus on supply chain optimisation, a better approach to building KM capability within their organisation is one that focuses on how tacit knowledge can be converted into explicit knowledge and subsequently shared more easily across the company (Dayan et al. 2017). One such technique is discussed in detail by Acar et al. (2017), who outline the relationship between enterprise resource planning (ERP) systems and knowledge management. ERP systems are essentially a means by which organisations can combine information relating to organisational processes into a common database. While there are a wide variety of ERP systems available, organisations looking to build KM capability should ensure that any ERP system they adopt has a clear emphasis on the way that knowledge is shared and utilised within the organisation.

In addition, Acar et al. (2017) put forward the notion that by focusing efforts on the effective use of ERP systems, higher levels of KM capability will often emerge as a beneficial by-product. This is especially important, as this study also indicates that KM capability is needed before the use of ERP systems will have any benefit effects on operational performance.

Knowledge Management as an Organisational Process

Managers face many challenges when looking to improve the KM capability within their organisation, and one of the most difficult is the variety inherent across the range of KM systems and processes. It can be quite daunting for a manager to undertake the deployment of a new KM system when there are so many factors to consider. However, some authors believe that there are some universal principles that can be applied to any business and within any industry to improve the likelihood of successful outcomes when establishing a new KM system or process. To illustrate some of these, Roy (2010) suggests the following best practices:

1. Make sure the metrics used are aligned with business objectives.
   The implementation of KM systems can deliver positive return on investment (RoI) results across a range of areas, but managers need to ensure that the way they are measuring the outcomes of the KM practices corresponds appropriately with the specific elements that the practices were set up to improve. For example, if a company implements KM practices that are

focused on reducing call transfers and repeat calls (for instance, giving more employees access to customer information databases so that calls do not need to be transferred), it would not be appropriate to assess the effectiveness of these practices with the metrics of average call times.

2. Build a cross-functional team that can bring a 360-degree approach to knowledge creation.
   A team with an ideal level of diversity would typically include members that fall under the following categories:

   - *lead expert*—an individual who will be responsible for determining how the resulting knowledge base will be organised, what specific topics will be covered and what roles will be fulfilled by the other team members, and ensure the ongoing maintenance of the knowledge base;
   - *users*—people who will be making use of the resulting knowledge base, and who can provide useful suggestions to assist the development process. It is crucial to involve the end-users of the KM system during the development stages, as this helps to ensure that the system is practical for the users when it is implemented, and also gives the users a sense of commitment to the system;
   - *knowledge authors*—individuals who have extensive experience and training in the use of knowledge authoring methods and tools;
   - *project manager*—an individual whose primary responsibility is to ensure that the project stays on track.

3. Focus on depth and quality rather than breadth.
   Tryin g to build a knowledge base that is all-encompassing will nearly always result in an incomplete system, and this will invariably lead to users abandoning the system due to inconsistencies and deficiencies. A better approach is to start the project with a narrower scope, and ensure that the resulting knowledge base is comprehensive enough to satisfy all users before expanding into other areas.
4. If the deployment appears to be falling behind schedule, narrow the scope of the knowledge base and finish on time.
   Another potential problem associated with setting an initial scope that is too ambitious is that a project may end up falling behind the scheduled date for implementation. It is much better to have a functional system released on schedule that has a narrower scope than originally planned, than to continually delay the implementation of the system in an attempt to fulfil the initial plans. A project that fails to make appropriate mid-course adjustments and does not deliver outcomes on schedule will quickly lose momentum.

5. Find knowledge base contributors who are both technically competent and not too far removed from customer contact.
   Balance in this area is vital, as developing a knowledge base with input only from internally focused domain experts will result in a system that is largely incomprehensible to customers, severely limiting its usefulness. On the other hand, relying solely on input from customer-focused experts will lead to a system that lacks the specific technical details necessary for such a system to be functional at all levels. Accordingly, equal weighting needs to be given to both areas.
6. Provide users multiple ways to access information.
   Typically, a KM system will be utilised by users with a wide range of expertise and familiarity with the content and the organisation. It is important to ensure that users with different levels of expertise are considered when developing the means of accessing the knowledge base. Experienced users may feel confident using browse and search functions to access information, but novice users may find FAQs and guided help features more beneficial.

While broad, these suggestions provide a good starting point for managers looking to improve the KM capability within their firm. Specific decisions about the type of KM systems and processes to implement will need to be made based on the circumstances of the individual company. Reinforcing these universal best practice principles, Koelliker (2017) also provides six suggestions. As shown below, these suggestions demonstrate a much stronger focus on the functionality of the KM system rather than the technical aspects, but still have numerous similarities to the principles discussed above:

1. Determine objectives and metrics.
   Similar to Roy (2010), the first step here is to ensure that the way KM practices will be measured is appropriate given the strategic objectives of the organisation. It is crucial to have a clear understanding of the company's objectives and determine the most appropriate metrics to use at an early stage, as these factors will shape the rest of the KM implementation. As the first principle in both Roy's (2010) and Koelliker's (2017) best practices for KM, there is a clear emphasis on the importance of appropriate measurement and metrics.
2. Plan the implementation strategy.
   Again, a strong emphasis is placed on the preparation and planning of KM practices, as a rushed approach to implementing KM within an organisation will often have no discernible benefit, or even have a detrimental effect. Ensuring that the team responsible for implementing the KM

project has the required experience, knowledge and skills is vital to its eventual success. In addition to the above roles suggested by Roy (2010), Koelliker (2017) suggests that executive sponsors and information technology (IT) experts are also necessary for a fully functional KM implementation team.

3. Design a robust knowledge base.
   As noted, the focus here is squarely on functionality, rather than depth and breadth. A knowledge base needs to be developed in direct conjunction with the existing inquiry resolution process, to ensure that all required knowledge is included and categorised effectively. Koelliker (2017) also emphasises the importance of content life cycle management, to ensure that the information contained within the knowledge base remains accurate and valid (a point that is further underscored in the sixth suggestion by this author).
4. Develop useful content.
   Further emphasis is put on the functionality of the KM system, with a specific suggestion to focus on the usefulness of the content that will be produced as a part of the knowledge base. The author indicates that considering both the quality and quantity of the information is vital, as is giving specific consideration to what kinds of information will be most useful to the end-users.
5. Optimise the user experience.
   Similar to the point made by Roy (2010), Koelliker (2017) suggests that providing a variety of ways to access the information will help to optimise the experience for the different kinds of users who will be accessing the KM system. An optimal experience for the end-user is vital if the KM system is to be effective, because even if the knowledge base itself is comprehensive and robust, it will not achieve successful outcomes if users find engaging with it too difficult.
6. Improve knowledge continuously.
   The sixth and final suggestion made by Koelliker (2017) reflects the volatility of information in the current day and age. It is not enough to develop even a near-perfect knowledge base and optimised experience for users, if the information in the system does not maintain its currency and accuracy. A further point is made here that the knowledge base should reflect real world solutions, rather than just being an accumulation of ideas that have not been properly tested or practised.

Evidently, there is no single set of best practices to follow when looking to implement KM systems within organisations. A variety of factors will influence

the manner in which KM should be developed and implemented in any given workplace, but by following the universal principles shown above where possible, managers should be able to avoid some of the common pitfalls associated with the deployment of KM systems and processes in organisations.

Knowledge Management Tools

A common concern among managers about implementing KM systems is a lack of certainty around how the KM practices and procedures will actually work within their organisation. The theory of KM is usually well understood, as are the potential benefits of successful KM systems, but the process of actually implementing them is often far less apparent. To assist with this, a wide range of KM tools and toolkits have been developed to assist managers with the process of implementation. Massingham (2014) provides an in-depth study of several of these KM toolkits and their associated tools, comparing their effectiveness within an organisational setting. This study looked at four KM toolkits in total, and concluded that the two most effective were the Knowledge Strategy Toolkit (KStK) and the Knowledge Measurement Toolkit (KMT). These two toolkits and the tools associated with them are discussed below.

The Knowledge Strategy Toolkit

The KStK involves the use of various tools to help managers focus on the knowledge required to effectively develop, implement and maintain organisational strategies. This toolkit was determined by Massingham (2014) to be the most effective when it came to implementing KM practices within a workplace. The KStK comprises three tools: competency mapping (Kaplan and Norton 2006), future capability requirements (Kaplan and Norton 2006) and sourcing decision (Lepak and Snell 1999).

Competency mapping involves a large-scale analysis of the workforce, using prescribed metrics to rate the capabilities of all areas of the organisation. Managers using this tool found it to be particularly effective in terms of enabling a more successful pattern of career development within the company. Having a clearer picture of where skills and competencies were situated across the organisation subsequently allowed for better decisions to be made regarding recruitment and training, promotion and employee career pathways. In addition, this information allowed for broader and more strategic

workforce planning, resulting in better links being made between current capabilities and future activity requirements. Massingham (2014) notes that the potential issues associated with the use of this tool largely centre on resistance from the people involved in the competency mapping exercise, as human resource management employees often have their own systems for managing this information and are reluctant to change these pre-existing systems.

The next tool, future capability requirements, is essentially the process of determining an objective account of the capabilities that will be necessary for the company in the future. Once this process has been completed, the next step is to categorise these future capability requirements into specific types of knowledge resources, so that productive KM activities can take place. This was seen as one of the most beneficial KM tools due to the fact that most companies struggle to think objectively about these issues, and often make subjective decisions about future requirements. For companies that are largely dominated by one type of knowledge resource (e.g., technical knowledge), this tool also enables a much broader approach to KM than the company would typically have. However, it was also noted that this tool required a significant time commitment, and the use of complex criteria to accurately identify and categorise the knowledge resources that the firm may require. To address this concern, Massingham (2014) raises the idea of using a custom-made software package to automate the process.

The third tool associated with the KStK, sourcing decision, relates to the decision made by management about how they will meet their capability requirements. This decision usually involves a choice between recruiting new employees, training existing employees, contracting workers from an external provider or forming alliances with other companies. The tool itself is derived from the make versus buy model proposed by Lepak and Snell (1999), and is determined on the basis of importance, uniqueness and risk. While managers generally agreed that this tool was useful in terms of developing more effective forecasting and planning systems, there were a range of potential issues associated with this tool as well. First, there was a concern around responsibility, in that many of the managers who used this tool felt that the final decision on sourcing was outside of their control. Second, managers felt that the tool applied too specifically to a singular point in time, and did not take into account the dynamic nature of an organisation. Third, many managers felt that this tool would eventually push all decisions towards contracting or alliances as knowledge naturally decays over time, and they felt that outsourcing was the only way to successfully address this problem. Massingham (2014) suggests that proper investment by the company in knowledge resources

would overcome this problem, but in turn would require appropriate validation to ensure that the correct decisions regarding investment, recruitment, contracting or alliances are being made.

The Knowledge Measurement Toolkit

The KMT focuses specifically on the analytics and metrics used to measure and value knowledge within the organisation, with a specific focus on the impact that loss of knowledge has on the company. This toolkit is comprised of three KM tools: knowledge valuation (Andriessen 2004), cultural change metrics (Massingham 2013) and risk management (Massingham 2010).

The first of these tools, knowledge valuation, draws on the theory of intellectual capital (Nahapiet and Ghoshal 1998) and provides a means to quantify the knowledge of each employee in terms of its value to the organisation. This is established by asking employees questions about specific areas of knowledge that are relevant to the organisation, and is useful for identifying key individuals, especially within large organisations where these employees may be harder to identify. Massingham (2014) does note that this tool can be particularly difficult to implement, however, as it requires the processing of a vast amount of information, and places a significant time burden on both employees and managers. There was a further issue as well, in that management often were unsure how they could actually use the results they obtained from this tool, although this may just be a matter of a lack of familiarity with the tool itself and the format of the results.

The second tool associated with the KMT, cultural change metrics, aims to complement any existing metrics around organisational change with a stronger emphasis on KM. In essence, the tool measures behaviours and attitudes that are required for a company to develop into a learning organisation (Senge 1990). As with knowledge valuation, issues were noted with the implementation of this tool, partially to do with the complexity of measuring organisational culture, and partly to do with how managers used the results. There seemed to be a tendency for managers to use the results of this tool to report positive outcomes, but to avoid using them to highlight areas for improvement. Massingham (2014) notes, however, that the results obtained from this tool (and the others in the KMT) were still very useful in terms of persuading stakeholders to invest in the company.

The third and final tool of the KMT, risk management, is based on existing risk management theory (Cooper 2003; Massingham 2010; Miller 1992). The tool quantifies the risks associated with the knowledge resources of an

organisation, allowing them to more effectively prioritise their responses to these risks. This tool was found to be particularly effective, likely due to the higher level of rigour that the model draws from the foundation of risk management theory. Additionally, managers found the results much easier to discuss than the results of many other tools. This ease of discussion had a downside, however, in that conversations would often become circular arguments around the subjective importance of individual risks, leading to a lack of action being taken. Massingham (2014) notes that the tool does have specific guidelines for developing actions to address the identified risks, but that managers often did not even get to that part of the tool, being too caught up in the earlier discussions, and avoiding what they perceived as the harder task of actually deciding what to do about the risks themselves.

The tools discussed above demonstrate that there are a variety of specific measures and actions that managers can adopt when looking to improve the KM capability within their firm. These tools provide a way to assess the current state of KM, a way to identify what kinds of KM processes and actions could be taken to address shortcomings or build on strengths, and also valuable data that they can use for areas outside of their KM strategy. This chapter has discussed how KM can be approached as a competency or as an organisational process, outlined some proposed universal best practice principles, and has now outlined some of the specific tools and toolkits that managers can use to improve the KM capability within their firm. To bring this all together, the final section of this chapter reviews some case study examples from firms around the world, to illustrate how best practice in KM is currently being demonstrated in a variety of different organisational contexts.

Knowledge Management Examples from Around the World

Example 1: ANZ—Banking on the Commitment to Knowledge Management

The Australia and New Zealand Banking Group Limited (ANZ) is among the five largest companies in Australia, and is also the largest bank in New Zealand. With total assets of around AUD$900 billion, and over 46,000 staff across 34 countries, they are a prime example of a contemporary multinational banking corporation (ANZ 2017). ANZ has been the focus of a number of case studies discussing various aspects of their operations including technology (e.g., Harorimana et al. 2012), strategy (e.g., Stockport et al. 2012) and human

resource management practices (e.g., Silverstone 2004). Given ANZ's size and spread across multiple countries and services, and particularly given ANZ's focus on technology-enabled services (especially internet banking), it is obvious that effective management of the company's knowledge is a key requirement in order for ANZ to remain one of the leading financial institutions in the Asia-Pacific region.

When ANZ acquired some Royal Bank of Scotland (RBS) subsidiaries in 2009, they were contractually required to integrate IT systems within a very short time frame (less than 12 months)—which included, to a large extent, the integration of knowledge (e.g., information about banking clients) across the two banks. In an attempt to complete this project on time, ANZ prioritised their processes; focused on simplicity and functionality, rather than elegance; and used their staff in multiple time zones to work 24/7 on this IT integration—which alone could be considered a feat of knowledge management.

One of Roy's (2010) principles of best practice refers to the scope of the KM deployment project—that is, large projects which may run behind schedule should be narrowed down in order to be completed on time. ANZ's approach can be considered best practice here because they considered the size of the project from the start and chose to narrow the project sufficiently to make it feasible, while also ensuring that they used their own resources effectively to accomplish their task. Adam Neat, head of IT strategy and architecture in charge of the IT transformation, explained: '[We] weren't looking to build a system that was overly pretty or ultra-elegant, rather we wanted to get in there, do what needed to be done to complete the project on time' (Hopewell 2010).

Other examples of effective KM practice at ANZ are explored by Harorimana et al. (2012) and Chuang and Hu (2015): ANZ use their KM system to connect various stakeholders and to enable efficient information exchange and collaboration between these, for instance, in the context of loan applications. Loan applications are processed online in the back office, which obviously requires that the relevant staff have access to the client information from their online or in-branch loan application. Linking with the Credit Bureau through the internet further allows ANZ to provide efficient services, but this again requires the integration of knowledge management with external stakeholders—all of which demonstrates the importance of Koelliker's (2017) best practice principle of bringing together knowledge base contributors who are technically competent with those who have close contact with the customers and/or other stakeholders required for the company's operations.

Another one of Roy's (2010) principles refers to users having multiple ways to access knowledge. Harorimana et al. (2012) provide an overview of some of the ways in which ANZ stakeholders can access knowledge, including:

- website
- social media
- telephone
- branches.

Given the confidential nature of some knowledge elements in the banking and financial services industry, certain pieces of knowledge are more widely accessible than others. This information clearly demonstrates a commitment from ANZ to efficient KM.

ANZ's pledge to KM was in the news again recently, demonstrating even more clearly their engagement with KM practices. In mid-2017, they expanded their existing agreement with Knosys, an organisation providing knowledge management architecture for medium-sized and large companies, to roll out Knosys' KM platform across all its business units (IDM 2017). The web-based nature of the platform is said to enable quick deployment across all business units, while also allowing companies to expand their KM project as and when required (Bourse Communications 2017). This is again evidence of ANZ's business activities demonstrating the KM best practice of allowing extensive access to information (because of the web-based platform) and carefully planning the size of their KM project (Roy 2010).

Example 2: Vodafone—Mobilising Knowledge Management in the Legal Department

Large, globally operating corporations tend to have large, geographically dispersed legal teams. Knowledge management is a key requirement to keep the legal departments operating efficiently, which is why many companies are using 'knowledge managers' to support their in-house legal teams in their endeavours to coordinate and efficiently use vast amounts of information.

Over the last 30 years, Vodafone has grown from its humble beginnings as a small UK-based mobile operator to become one of the most valuable brands in the world, with total assets exceeding £154 billion. With operations spanning more than 30 countries, and partnerships with networks in more than 50 more countries, Vodafone makes use of the knowledge and skills of over 100,000 employees (Vodafone 2017). Accordingly, their legal team is tasked with the unenviable responsibility of managing the vast quantities of information arising within a telecommunications company operating on this scale.

As per the principles outlined by Roy (2010) and discussed above, successful implementation of KM systems requires a lead expert, responsible for the organisation of the knowledge and other ongoing maintenance issues, and a project manager, responsible for keeping the deployment project on track. A knowledge manager can be considered to take both of these roles (Weinreich and Groher 2016). Vodafone is an example of a large multinational company that has dedicated knowledge managers in their in-house legal department. These individuals are responsible for:

- organising large amounts of decentralised and dispersed information in accessible central locations (to make it easy for the legal team to access said information);
- ensuring accuracy and ongoing maintenance of the system (to make it easy for the legal team to have access to the correct, up-to-date information as and when required);
- championing, as well as educating staff members about, the importance of ongoing updates and maintenance of the information in the knowledge management system (Gould 2015).

The activities on which Vodafone is focusing here demonstrate how the KM tools recommended by Massingham (2014) would be useful in such a context. There is a clear emphasis in Vodafone on the mapping of existing knowledge (measured by *competency mapping* in the KStK), the forecasting of future requirements (measured by *future capability requirements* in the KStK); the identification of valuable knowledge (measured by *knowledge valuation* in the KMT); and the championing of cultural change towards a culture of KM (measured by *cultural change metrics* in the KMT).

While Vodafone has benefited from the presence of dedicated knowledge managers for a number of years, this case study focuses on a specific aspect of Vodafone's in-house legal knowledge management: a tool called 'Canary'. As noted above, Vodafone is a highly diversified, internationally operating corporation, which offers over 130 products potentially in 208 countries and territories. This size and complexity means that legal staff used to require a substantial amount of time (up to three days) to establish which products could be sold in which countries. This activity was very time consuming because of the dispersed nature of the information that staff needed to access: there was no simple integration of tax, regulatory, legal, billing and product department information and staff had to consult with each of these in turn.

In an attempt to reduce the time frame for this kind of decision, Vodafone established a knowledge management tool called Canary that enables their

legal staff to access the same kind of information as above, but with a maximum of five clicks. In 2017, Vodafone Global Enterprise won a knowledge management innovation award from Legal Week for their Canary tool (Legal Week 2017).

Roy's (2010) best practice guidelines refer to the need for KM implementation teams to include both technically competent and customer-related members. Canary stems from a team of analysts familiar with the company's database, and a volunteer team of legal employees who reviewed the information and appraised it for completeness and accuracy (Legal Week 2017).

Despite Roy's (2010) call for KM implementation to be done by cross-functional teams, Canary was developed by the legal team, for the legal team; while this means that the system does not currently cover all other aspects of the company's operations, it does again demonstrate the need for KM implementation projects to be somewhat narrow in scope to begin with and then to increase the scope gradually (Roy 2010). According to Legal Week, the next steps for Vodafone will be to integrate the tool with the company's other internal systems, so that Canary will be able to benefit the sales and commercial teams.

Given that Canary is an online-based tool, its accessibility to all potential users is clear.

Example 3: Goodyear Tire & Rubber Company—Treading Carefully with Knowledge Management Metrics

Goodyear Tire & Rubber Co. (Goodyear) was founded over 100 years ago and has since grown into the world's largest tyre company. With total assets of over US$16 billion and around 66,000 employees across more than 60 countries, it is clear that managers at Goodyear are faced with an extensively complex and dynamic task when it comes to KM (Goodyear 2017). However, not only has Goodyear met the challenges of KM in the manufacturing sector, it has been recognised as having award-winning KM practices. One such practice was its establishment of a Knowledge Management Office (KMO), which combines the roles and responsibilities of knowledge managers by also focusing on collecting and organising information, as well as enabling employees to connect with the information and with each other (Majerus 2016).

Goodyear's KMO has always been focused on measurements and results, which resonated well with the criteria for the KM Reality Award, provided by the KMWorld 2016 Conference in Washington DC (KMWorld 2016). This award specifically required nominees to define clear metrics that evaluate the

KM initiative and its role in achieving the company's goals (KMWorld 2017). In 2016, Goodyear won the KM Reality Award with its 'Collect & Connect' initiative, which began in 2010. Dean Testa, leader of the Goodyear KMO, explained their emphasis on measurement and results: 'The first thing we started with was business objectives, to ensure that the KM programme will produce value and provide return on expectation. We don't do KM for the sake of KM' (Raths 2017). This clear focus on ensuring that the metrics they use to assess their KM practices are congruent with the overarching strategic business objectives highlights the best practice principle outlined by Roy (2010) and Koelliker (2017).

Collect & Connect was developed in order to prevent the loss of the vast knowledge held by those employees who were close to retirement age—because much tacit and explicit knowledge is embedded in this experienced workforce, staff retirement is a key risk for organisations and needs to be managed effectively, for instance by relying on a KM risk management toolkit (Cooper 2003; Massingham 2010; Miller 1992). Consequently, Collect & Connect is a KM tool that facilitates employees' ability to record, share, access and ultimately reuse information, especially in a multigenerational context. However, what makes this initiative stand out from other KM initiatives is its emphasis on the measurement of results. Being aware of the complexity of KM and the interdependency of its different elements, Goodyear carefully measures the outcome of their KM activities with the help of multiple metrics, notably:

- *KM maturity assessment:* Goodyear solicits the help of select universities to regularly evaluate the maturity of their KM processes. Results are further validated through focus groups, which allows for regular progress to be made in the implementation and development of the KM practices (Raths 2017).
- *Value pyramids:* to ensure that all managers in the organisation are aware of the importance of KM practices, value pyramids demonstrate and visually present the values achieved from each KM activity (Raths 2017).
- *KM Dashboard:* to further emphasise the importance of KM and allow employees to engage with KM directly, Goodyear has developed an intranet site that enables employees to see information about the KM tools in real time with statistical and trend analysis (KMWorld 2016).
- *Additional external collaboration:* Goodyear relies on other external collaborations and benchmarking to further measure its own KM practices and compare itself against others (Raths 2017).

Specific, measurable results from the above-mentioned KM initiatives include a reduction in development cycle time by 50%, as well as updates to design standards and faster achievement of competencies through learning journals (KMWorld 2016).

Example 4: Mass Transit Railway Corporation Limited—An Express Culture of Knowledge Management

Hong Kong's Mass Transit Railway Corporation Limited (MTR) is regarded worldwide as a leading railway operator, consistently setting benchmarks in the areas of safety, reliability, customer service and cost efficiency. Originating in 1975 to address the need for a mass transit rail network to service the population of Hong Kong, MTR has grown through corporate mergers and investments to become a major global enterprise. With assets of over HK$145 billion, more than 26,000 employees and operations in their home country of Hong Kong as well as in international markets in England, Sweden, China and Australia, managers at MTR face a complex challenge when it comes to KM within their company (MTR 2017). To address this challenge, the Operations and Project Divisions of MTR revised the KM practices of the firm and launched a new KM policy in 2003 (MTR 2003). This approach strongly emphasised building a learning organisation (in fact, MTR called the entire policy *Learning Organisation*) and generating a culture of development and sharing within the company (Massingham 2013; Senge 1990). In subsequent years, numerous initiatives were developed by this department, and the extensive work that MTR put into their KM strategy was recognised with a Hong Kong MAKE (Most Admired Knowledge Enterprise) Award in 2009 (MAKE 2017).

What, then, are the award-winning activities that MTR has actually developed to improve the firm's KM? Some of MTR's initiatives focus specifically on developing an in-house KM culture, and have been implemented to address the issues associated with retaining the knowledge of the numerous staff members who are close to retirement (approximately 500 employees have left the MTR in recent years due to retirement). Two of these initiatives are described below.

- *M-Tube:* This initiative was implemented in 2008 and enables staff to record their knowledge (in video format) and therefore share it with both their current and future colleagues, with the help of a website similar to YouTube. For instance, technical staff took videos of themselves while fixing specific parts of a train in order to demonstrate best practice in repair and maintenance (Loo 2011). This initiative reflects Koelliker's (2017) best practice principle of ensuring that knowledge reflects real-world solutions that are tried and tested.

- *MTR Creator:* Also implemented in 2008, this initiative is a portal for interactive discussion that allows staff to contribute documents, ideas and discussion topics. Staff are able to connect with others in their own discipline, as well as within generic forums focused on areas such as 'Productivity'. Given that MTR requires staff to work in shifts, this kind of portal not only allows for multigenerational knowledge sharing, but also enables information exchange across different shifts (Keefe 2010). Allowing staff members at all levels and at all times to contribute to knowledge collections and to interact with one another in this manner further demonstrates MTR's application of Koelliker's (2017) principles of best practice; this initiative gives staff the opportunity to continuously update and improve the knowledge that they themselves place into the knowledge base.

Other activities implemented by MTR focus on sharing knowledge with, and learning from, other KM professionals (MAKE 2017), for instance:

- *MTR Academy:* A wholly owned subsidiary of MTR Corporation, the MTR Academy was established as a research and training hub to develop railway executives and professionals through in-house training programmes. In addition, the Academy offers training programmes to staff in other global railway provider companies. A key aim of the MTR Academy is to share best practices both within the company and with external organisations in order to improve the railway industry globally (MTR Academy 2017a). Specific short courses on KM in the railway context are offered (MTR Academy 2017b), which further demonstrates MTR's commitment to KM.
- *Partnering with knowledge institutions:* MTR Corporation operates in collaboration with multiple universities in Hong Kong (e.g., Hong Kong Polytechnic University and Hong Kong College of Technology), as well as international universities (e.g., University of Wollongong), in order to deliver their own training programmes and to provide MTR staff members with access to knowledge at other institutions (MTR 2015; MTR 2016). This further exemplifies the company's emphasis on knowledge sharing.
- *Engaging with KM professionals:* Arup is an international firm of designers, engineers, planners and business consultants (Arup 2017a), who not only operate based on their own well-developed and award-receiving KM system, but who also help client organisations to improve and develop their own KM practices and systems (MAKE 2017). In 2009, Arup supported MTR with the development of its Knowledge and Information Management infrastructure by engaging with the entire process from conception and personalisation for MTR's circumstances, to project management of soft-

ware and system development, to technical implementation and staff development (Arup 2017b). Arup itself regularly appears on the list of winners of the Hong Kong MAKE, and so is an ideal partner for a company such as MTR, as both have a clear emphasis on developing strong KM processes (The KNOW Network 2016). The relationship between MTR and Arup exemplifies how implementation of KM projects can benefit from drawing upon external partnerships. Companies have better access to specialised expertise (Lepak and Snell 1999), particularly in the IT context (Koelliker 2017; Roy 2010), and can develop custom-made software solutions that can be integrated into existing systems in the future (Massingham 2014).

Conclusion

As discussed throughout this chapter, due to the rapidly changing business environment and the dynamism and volatility of the globalised world, it is very difficult to define a single set of best practices in KM. It is easy to see the vast range of KM practices and theories as somewhat of a blur, with little or no way of establishing useful learning opportunities. However, by being aware of the different approaches that can be taken to KM, studying the principles and tools advocated by experts in the field, and examining the award-winning activities and initiatives being implemented by firms around the world, a clearer picture begins to come into focus. KM systems and initiatives will always need to be tailored by individual companies to meet their own circumstances, but this chapter has provided an overview of the current thinking in regards to best practices in KM and demonstrated that these best practice principles can be successfully applied in diverse organisations. Hence, managers are able to maximise the effectiveness and efficiency with which they implement KM across their organisation by combining an awareness of best practice with a clear understanding of the need to tailor KM initiatives to their own organisation's specific context and requirements.

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27

A Critical Realist Pathway to Relevant and Ethical Research

Jawad Syed and John Mingers

Introduction

Previous research has used critical realism to develop a characterization of knowledge that recognizes the diverse ways in which human beings may be said "to know" (Archer et al. 2013; Mingers 2008). Related to the diverse ways and forms of knowing, their practical utility and ethical dimensions are of increasing interest to scholars and practitioners (Booker et al. 2008; Denzin and Giardina 2016; Fletcher et al. 2016). The research–practice gap is of growing concern for academics and managers, not least because the recent global economic crisis can be seen to some extent as resulting from traditional MBA-type education within business schools (Reed 2009; Welsh and Dehler 2007). Previous studies (e.g., Bansal et al. 2012; Lion et al. 2013) have indicated that there is often little resemblance between management research and its practice in organizations. Nonaka and Toyama (2003) suggest that knowledge creation may be seen as a dialectical process, in which various contradictions are synthesized through dynamic interactions among individuals, the organization, and the environment. Although the research– practice gap is widely recognized and frequently lamented, barring some notable exceptions

J. Syed (✉)
Suleman Dawood School of Business, Lahore University of Management Sciences, Lahore, Pakistan

J. Mingers
Kent Business School, University of Kent, Canterbury, UK

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(e.g., Cross et al. (2013) use organizational network analysis to address the gap), there is not much discussion about how it can be bridged. Khurana (2007) has documented the way in which US schools have changed from being wide-ranging "professional schools" to becoming training grounds for narrowly based technocratic managers. Starkey and Tiratsoo (2007) argue that the main problem with business schools is that the focus on teaching has given way to one primarily concerned with research, but research that is of a particular kind—highly academic and theoretical and divorced from practice. For example, Lion et al. (2013) note that research on environmental impact assessment has been conducted mostly from a governmental perspective, producing a clear gap between research development and business practice. Similar concerns, although often with varying solutions, have been expressed by Thomas and Cornuel (2011, 2012), Starkey and Tempest (2009), Wilson and Thomas (2012), Hodgkinson and Rousseau (2009), and Hodgkinson and Starkey (2011).

Van de Ven and Johnson (2006) suggest that there are three ways in which the research–practice gap has been considered: as a knowledge production problem where insufficient attention is paid to the context and potential purposes of their research; as a knowledge transfer problem wherein little or no attention is paid to making the results of their research practically relevant and communicable; or as a philosophical problem of incommensurability between very different *Weltanschauungen*. These aspects of the situation are also indicated in previous studies which suggest that it is not actually the width of the research–practice gap that schools and policy-makers should pay attention to, but rather the lack of sufficient bridging mechanisms to span research and practice (Syed et al. 2010; see also Anderson 2005).

For scholars who wish to improve the research–practice relevance by enhancing knowledge transfer, Starkey and Madan (2001: S6) portray the interplay between science and practice by using a "knowledge chain." According to this chain, knowledge—which can be jointly developed by practitioners and scholars—influences managerial decision making and subsequently effective action. The guiding principles of this chain are "that knowledge should inform action; and that action becomes knowable if we understand better the underlying principles that link cause and effect" (p. S6). Although Starkey and Madan support the idea of interaction between science and practice when it comes to knowledge creation and its dissemination, the underlying assumption is that knowledge flows from theory to practice in an almost unhindered way. Thus, the achievement of relevance itself is not considered to be a big problem. Even though Starkey and Madan (2001) and others (e.g., Buckley et al. 1998) have provided important and much welcomed

insights on the relevance of management research, the reality is far more complex than is suggested by the rather linear models of knowledge transfer that underlie these contributions. There is a research deficit when it comes to better understanding how the systems of research and practice interact with each other, whether they can interact at all, and what this means for our understanding of relevance.

This chapter adopts a critical realist (CR) perspective to develop a nondeterministic notion of resolving research–practice inconsistencies within the field of business and management. Such inconsistencies manifest themselves in a variety of ways such as in performative contradictions or simply a mismatch between theory and empirical evidence (Bhaskar 1978, 1998; Tourish 2013). Although, ideally, it may be possible to tackle and resolve research–practice inconsistencies through the conventional cyclical process of scientific practice, some inconsistencies may be rather intractable, defying resolution due to deeper, more fundamental issues (Smith 2006). We argue that in the case of intractable situations, a CR perspective may help us understand and possibly resolve the disjuncture of theory and practice, and positivism and interpretivism, through a new set of ontological premises.

We explore a CR perspective in solving problems related to the ontological and causal underpinnings of management research. We argue that, despite their merits, both positivism and interpretivism, the dominant management research paradigms, provide impoverished and reductionist ontologies that fail to deal with the depth and complexity of the world that managers face. This, then, has implications for research design, where we argue that multiple research methods, in a CR fashion, may be needed to do justice to the differentiated nature of social and organizational reality. We further argue that the adoption of CR brings with it an explicit ethical dimension that is currently lacking in positivism and at most implicit in interpretivism. We consider the effects of commercial and practical constraints on management research and consultancy, which in the main prioritize strategic and short-term business outcomes with relatively less attention paid to a holistic view of business in a society. Such literature and practices, we argue, in turn serve to aggravate the gap between academic research focused on social aspects of management and actual practice which at times may ignore the social implications of management.

The chapter is structured as follows. First, we discuss the research–practice gap and the ontological component of the business research explaining why a CR paradigm may offer a better alternative than the currently dominant approaches. We explain the need for plurality of theoretical and methodological frameworks which are both constructed in accordance with CR ideas and

capable of empirical application in a substantive area of enquiry. Finally, we discuss how the adoption of CR brings with it an explicit ethical dimension which is either lacking or implicit in other approaches.

The Research–Practice Gap

In this section, we discuss the gap between academic research and practical problems and highlight that many real-world problems are both too complex and too interdisciplinary to be understood and resolved by puritanical approaches that may lead to non-practical outcomes.

The Growing Gulf

Many of the concerns about the research–practice gap, certainly from a practitioner's perspective, are summarized in an article in the *Financial Times* on the "growing gulf" between managers and research (Ghobadian 2010; see also Tenhiälä et al. 2016). Ghobadian notes that one significant concern is the gap between the values and ideologies of researchers and users—that is, academics, students, consultants, policy-makers, and managers. Ghobadian (2010: last para.) argues that unless researchers pay greater attention to the needs of practicing managers, "the impact of management research will lessen and the gap between researchers and users will in time become a chasm."

Ghobadian's concern is reminiscent of Astley and Zammutto's (1992) engagement with the argument that business school research is largely ignored by practitioners and that its impact on practice is perceived to be almost irrelevant. Astley and Zammutto explain this apparent lack of relevance in terms of the fact that management research and practice each have their own specialized forms of discourse, their distinct linguistic traditions. The transfer of knowledge between the research and practice domains, therefore, cannot take place in such simple terms as researchers telling managers what to do based on their empirical investigations. Moisander and Stenfors (2009) have described how differences in epistemic culture may complicate communication and cooperation between academics and practitioners (e.g., in the context of modernist management scholars and contemporary post-bureaucratic knowledge organizations). In other words, whenever management research is used as the foundation for practice, it requires a considerable amount of reformulation. In effect, in order to make basic management research work, it has to be radically reinterpreted by managers in accordance with the requirements of the organizational context of practical application (Gruber and Niles 1975).

The Ontological Epistemological Components of Business Research

Ghobadian (2010) suggests that much academic research, especially that aimed at four-star journals, tends to be highly quantitative and positivistic, and somewhat alien to practicing managers. He suggests that qualitative, interpretive research is "closer to the methods that most managers use" (para. 7). From a CR perspective, we would suggest that, individually, both are necessary, if not sufficient, to help us understand and try to steer the complex world we now inhabit. Vast amounts of data and information are routinely available (now recognized by the term "big data" (George et al. 2014)) and quantitative methods are necessary to help us make sense of the stories that may be hidden within. At the same time, the increasingly diffracted and globalized world makes it ever more necessary to recognize the many different perspectives, viewpoints, and *Weltanschauungen* through which managers experience their daily lives.

In his theorization of engaged scholarship, Van de Ven (2007) argues for a participative form of research that emphasizes the interaction between scientists and practitioners. The author highlights the need to acknowledge that practitioners, as sources of problems and data as well as users of solutions devised by scholars, are important stakeholders in scholarship (see also Van de Ven and Johnson 2006). Similarly, in their endeavor to enhance the relevance of management research, Schultz and Hatch (2005) suggest that instead of aspiring to translate their theoretically derived knowledge into practical solutions (e.g., consulting tools, new management practices), researchers should tap into practical knowledge in order to produce better theories.

This view is also shared by Whittington et al. (2001) who regard theory and practice as a more tightly linked duality; they argue that this "greater sensitivity towards practical complexity will promote a more comprehensive notion of rigor" (p. 486). In other words, there is to be no softening of academic standards. The practical working out of the duality of theory and practice will raise the stakes considerably in terms of the social production of knowledge. Pettigrew (2001) notes that the action steps to resolve the older dichotomy of theory and practice were often portrayed with the minimal request for management researchers to engage with practitioners through more accessible dissemination. However, dissemination occurs too late if the wrong question has been asked. A wider and deeper form and range of engagement between management researchers and practitioners is needed (Pettigrew 2001: S67, 2011).

Put crudely, positivism reduces the real world to the world of empirical data, thereby denying the existence of structures and mechanisms which may

not be directly perceptible, while interpretivism reduces the world to our knowledge or beliefs about it, thereby denying the existence of objects of that knowledge. Neither by itself is helpful for addressing the practical concerns of managers. Positivism is interested in holding facts separate from values, by separating the way the world is from the way it ought to be. Intrinsic in social sciences is a belief that research is to remain ethically committed (e.g., David Hume's philosophy presented in Kolakowski 1968).

However, despite its merit, the proposal of paying greater attention to the needs of practicing managers is not without certain pitfalls. For example, in some instances (such as in cases of ethical and social concern), the needs or priorities of practicing managers may not (and should not) serve as an adequate goalpost or benchmark for academic research. Similarly, by virtue of their very different "clients" (students for academics, and consumers for practicing managers), it may not be assumed that the needs and priorities of researchers and users will always converge (Cornelissen and Lock 2002, 2005).

This view is also supported by Kieser and Leiner (2009) who highlight the "unbridgeability" of the rigor–relevance gap in management research. The authors suggest that researchers and practitioners cannot collaboratively produce research that is rigorous as well as relevant; they can only cause irritations to each other which may occasionally turn out to be inspiring. Indeed, practicing managers are subject to many pressures and real-life constraints (e.g., changes in consumer behavior and regulatory requirements, economic recession, mergers and acquisitions) which do not directly affect academic researchers, who may have the relative luxury of focusing not only on business goals but also on social implications of management strategies.

A Critical Realist Perspective

CR deals with critical application of realism which produces a stratified understanding of the world, dividing the *real* from the *actual,* and the *empirical*, and the structures and mechanisms that produce events, from the events themselves (Bhaskar 1998; Jefferies 2011). From a CR view, there is a reality independent of our subjective thinking about it that science can study.

CR combines depth ontology (that there are real, generative mechanisms and structures underlying events and our human phenomenal experience) with epistemological relativism (that knowledge is a social product, and consequently, there is no ahistorical and non-contextual vantage point from which to determine the truth-value and criteria for rationality). Ontological being in the world is approached and understood as a depth ontology, entail-

ing that we distinguish between three levels of reality: the empirical—the relatively small number of events that we observe and record; the actual—the wider set of all events that do (or do not, even if expected) occur; and the real—the encompassing domain of structures and mechanisms that causally generate the actual events. At each stratum, ontological features qua generative mechanisms hold real, actual, and empirical characteristics, and are susceptible to scientific investigation in accordance with CR's philosophical materialist framework (Davis 2011). Such an approach enables us to better understand and explain why things are and also encourages the use of multiple methods on real problems.

Although ideally it may be possible to resolve research–practice inconsistencies through the conventional cyclical process of scientific practice, some inconsistencies may defy resolution due to deeper, more fundamental issues. We argue that in the case of intractable situations, a CR perspective may help us understand and possibly resolve the disjuncture of theory and practice, and positivism and interpretivism, through a new set of ontological premises.

The Case for Critical Realism

We argue that CR has a strong realist ontology, acknowledging the existence of a causally efficacious external world of structures and mechanisms, not all of which may be perceptible (the real), that generate the events and occurrences of daily life (the actual), a subset of which we observe and experience (the empirical). However, CR also accepts that we only ever have partial or limited access to the world through our perceptual and linguistic capabilities so that knowledge will always be epistemically relative and fallible (Bhaskar 1978). CR also accepts that the social world is inherently different from the physical world, which places further limitations on our access to it (Bhaskar 1979). The following are the main characteristics of CR relevant to the concerns of this chapter.

CR has a stratified model of reality in which the domain of observable, measurable, empirical events is a subset of all the events that actually do occur (Tourish 2013). These, in turn, result from the interplay of underlying structures and mechanisms, of many different kinds—physical, social, and cognitive—each of which has particular powers or tendencies to act and behave in particular ways (generative causality). The scientific logic of CR is therefore neither purely inductivist, constructing general laws that cover particular empirical instances, nor purely deductivist, deducing particular consequences from known or assumed axioms, but rather it is "abductive" (Peirce 1878) or

"retroductive." That is, it proceeds from some accepted event or observation in the empirical domain to try and understand and explain why this has occurred by hypothesizing potential explanatory mechanisms which, *if they existed,* would indeed account for the observations. It then tries to test which of these does actually exist and may be operative. CR is thus both creative and rigorous.

This approach, we believe, ties in very well with real-world issues: it recognizes their inherent complexity and multidimensionality; it accepts both the "hard," material and the "soft," human aspects of problem situations; and its notions of generative causality and retroduction mirror in many ways our commonsense approach to understanding and explaining puzzling events.

We can illustrate these features with some examples from the literature. Volkoff et al. (2007) looked at the relations between technology and organizational change using a three-year study of enterprise systems implementation. They found that neither technological determinist nor constructivist approaches such as actor–network theory could adequately explain their findings and used CR to explain the process of change in three stages in which the ostensive, performative, and material aspects interacted differently at each stage. Along similar lines, Mutch (2010) uses CR to analyze the effects of developments in information and communication technologies on organizational structure, particularly emphasizing the need to disaggregate technology into a range of features and levels so that their interactions can be explored.

Wry (2009) suggests that the area of business and society scholarship (which is clearly highly relevant to the theory and practice debate) has been held back because of its underpinnings in either economic theory, which tries to demonstrate links between social responsibility and profitability, or moral theory, which argues that organizations should be socially responsible for purely normative reasons. He argues that a combination of CR together with neo-institutional theory can generate a much richer and more realistic theory which grounds the normative ethos in real organizational mechanisms rather than just appealing to the manager's moral or economic values.

Welsh and Dehler (2007), in another highly relevant contribution, analyze the lack of change and development in the business school (and particularly the MBA) curriculum over 20 years despite this model's manifest lack of success in the real world. They use CR to identify the underlying generative mechanisms that both necessitate and constrain change and reinvention. Finally, Fleetwood and Hesketh (2006) consider why it has proved so difficult to demonstrate a measurable link between the human resources practices of an organization and its performance. They argue that this is primarily because of the pre-eminence of positivistic, "scientific" approaches which emphasize

quantification at the expense of the development of an adequate theory with the proper degree of explanatory power.

CR allows for the resolution of the research–practice inconsistencies through a reinterpretation of the activity of research. It offers a notion of causality that is consistent with the quest for answering the underlying "why" questions posed in business research (Bhaskar 1978, 1998). It also provides interpretivists with an ontology that strongly asserts the crucial role of meanings, interpretation, and context. In doing so, CR allows for the pursuit of an interpretivist agenda without denying the existence of the subject under study or its role in regulating research (Smith 2006).

We consider CR useful in recognizing the existence of logical connections between the ontological, epistemological, and methodological premises of research. A CR perspective is more likely to produce coherent studies than is uncritical pragmatism, which may ignore such linkages. Paradoxically, CR can also be seen as epistemologically pluralist because, in reconceptualizing the ontological basis of inquiry, problems associated with the mixing of alternative metaphysics may be circumvented (Lipscomb 2008).

Scott's (2000) critique of school effectiveness research and mathematical modeling provides useful examples of how CR can be utilized to show the practically inadequate and often vacuous philosophical bases of approaches dominating the educational research and policy agendas. While both positivism and interpretivism have their unique features and strengths (e.g., in positivism, the development and testing of hypotheses in a manner that is both quantifiable and replicable, and in interpretivism, the attention to understanding the individual experience), both these paradigms, taken by themselves, have severe limitations in terms of their ontological presuppositions.

Informed by CR theory, this chapter underscores the need to enhance the ontological component of business research in order to bring it in line with the CR natural and social realism as well as the concepts of structures and generative mechanisms (Dobson 2002; Mingers 2004a, c).

Theoretical and Methodological Plurality

Ghobadian (2010: para. 10) notes that "the values encouraged by the Research Assessment Exercise—REF's predecessor—and the promotion criteria militate against impact. The reward system is skewed towards publishing in four-star journals where such articles are overwhelmingly quantitative and the presentation style is geared to peer group needs. Only a minority of schools genuinely value impact, devoting resources and offering incentives so that managers

can access their research." This, Ghobadian (2010: para. 2) notes, is despite the fact that "[p]racticing managers rely on knowledge acquired through experience, rather than specific formal training, to judge research. Qualitative research is closer to the method most managers use to acquire knowledge and is therefore more likely to be adopted."

To overcome the disjuncture of theory and practice and positivism, it is not sufficient to simply recognize that there are different yet equally valid research paradigms. In the same way that the complexity of real-world problems requires a degree of interdisciplinarity, it also requires the use of a variety of different research methods—mixed-method research (Tashakkori and Teddlie 2003) or multimethodology (Mingers and Gill 1997). While there is a growing acceptance in principle of the value of multimethodology (see, e.g., a major business research methods text such as Bryman and Bell (2003)), there is still a degree of resistance by top journals (Mingers 2003) and grant-awarding bodies. This relates to the conservative and disciplining nature of the disciplines and to the battles over paradigm incommensurability which are still being fought (Mingers 2004b).

CR may be seen as a philosophical tradition committed to "under-laboring" for substantive theories, for example, by helping to clarify concepts. Accordingly, various extant theories may be integrated to design research and understand its implication, drawing ideas from CR. For example, there has been a call for those in the neo-institutionalist tradition to engage more with critical management (Lawrence et al. 2009). Scholars have also pointed towards emerging issues such as the performative potential of the critical agenda and the way it can be released (Spicer et al. 2009).

The importance of critically developing the research design cannot be overstated. This may involve questions such as whether the research design (Clarke 2003): (1) is appropriate to the domain and the phenomena being studied; (2) reflects the state of knowledge at commencement, both of the domain and of research methodology; (3) combines research techniques in such a manner that the weaknesses of each are complemented by the strengths of the others; and (4) is practicable. Furthermore, it may involve asking whether the research is likely to produce data that: (1) reflect the phenomena under study; (2) can be subjected to validation testing; (3) can have powerful techniques applied to them to tease out the relationships among the variables; (4) are likely to produce results relevant to the world; (5) are likely to be accessible to prospective users and audiences; and (6) are innovative and interesting. Clarke (2003) argues that considering these questions will ensure that scholars are focused not only on the rationality of the research product but also the rationality of the research process.

In his study of the "standard" accounts of research in information sciences, Smith (2006) recasts one such debate in light of CR assumptions: technological determinism versus social construction of technology. Smith proposes that a CR ontology allows for one reinterpretation of the activity of science as implicitly predicated upon natural and social realism as well as the concepts of structures and generative mechanisms. Similarly, in their exploration of the notion of CR in the nursing profession, McEvoy and Richards (2003) found CR to be particularly useful to evaluate front-line services seeking to use evidence-based interventions, as interventions need to be properly understood if they are to be used effectively in the context of clinical practice. Tourish (2013) notes that while CR acknowledges epistemological relativism, it also accepts the need to construct robust causal explanations for social phenomena.

Scott (2000) confronts beliefs in this approach with four main problems: the ways in which systematic unpredictability undermines predictive claims; its misunderstanding of the nature of open and closed systems; its conflation of association with causation; and its wholesale neglect of the intentionality of social life. To do so, however, requires ideas similar to those proposed by Bourdieu's (1990, 1996) relational theory and Bernstein's (1996) theory of the structuring of pedagogic discourse. Such concepts may be used in conjunction with a CR approach to bridge the research–practice gap, and to help empirically describe and analyze the object of study (Maton 2001).

The foregoing has highlighted the need for plurality of theoretical and methodological frameworks which are both constructed in accordance with CR ideas and capable of empirical application in practical research of a substantive area of enquiry, such as business education and practice. One useful approach can be found in Archer's (1995) characterization of relations between the philosophical underpinnings, theoretical and methodological approaches, and concrete empirical studies. According to Archer's perspective, "explanatory methodology" serves to regulate the relationship between social ontology and empirical research. In other words, the procedures of disciplines provide the means for the translation of CR principles into and realization within substantive studies. Maton (2001) argues that CR and educational research need each other. Ill-conceived policy decisions based on tacit empiricism shape the working conditions of educators and researchers, and the relentless march of technicist managerialism shows no signs of abating. Here, then, is an area of enquiry where CR can make a real difference not only to a narrow and muddled intellectual terrain but also to the daily lives of practitioners by providing the philosophical basis for and legitimation of alternative approaches and practices.

The Ethical Presuppositions of CR

A critical realist consideration in our perspective on the research–practice gap is the issue of values and ethics in management decision making. In this section, we address this more directly. In the past, decisions could be made purely in the interests of profit, shareholder value, or even managerial reward, and this was supported by the business school curriculum based on economic rationality and technical modeling. Philosophically, this was underpinned by positivism, with its absolute separation of facts from values and economics from morality. This was not always so, and it is ironic that Adam Smith, whose work is often assumed to support of the separation of market economics from ethical considerations, did not think that at all. His first major work, *The Theory of Moral Sentiments* (Smith 2002 (orig. 1759)), was a treatise on the fundamentally moral nature of human action and this work underpinned his more famous discourse on the economic system, *The Wealth of Nations* (Smith 2008 (orig. 1776)).

The usual alternative to positivism, interpretivism, does not fare much better since its subjectivism and its individualism give it no external standpoint from which moral judgments can be made. CR is different in that it rejects the Humean demarcation between fact and values, and argues that social science is unavoidably evaluative and committed (Bhaskar 1986; Mingers 2009).

CR's view of morality has two main principles:

- *moral realism*, that is, that there are moral truths independent of the subjective views of individuals or traditions, ultimately grounded in characteristics of human nature;
- *ethical naturalism*, which implies that we can, through social science, discover what these moral truths are. This requires us to move from facts, how things are, to values, how things ought to be.

Traditionally, science has rested on the premise that facts and values are separable, and science is only concerned with facts—and, following Hume, that you cannot logically derive an "ought" from an "is." The first argument below establishes that (social) science is not value-free but unavoidably evaluative.

The subject matter of social science, the phenomena of the social world, is itself intrinsically value-laden, and it is wrong for social science to try and avoid this by redescribing the phenomena in neutral terms. For example, while (A) "X was murdered" and (B) "X ceased breathing" may both be true descriptions of the same event, (A) is to be preferred to (B) because: first, it is

more accurate and particular—(A) implies (B) but not vice versa; second, (B) tends to carry the presumption that X died naturally, since that is more common, when that is not in fact the case; and third, (A) maximizes the explanatory power of the theory required to explain it. Thus, (B) would only require a physical explanation of what made X stop breathing while (A) requires psychological or social explanations of the reason for the murder. This example shows that the subject matter of social science is inevitably and intrinsically value-laden and that social science is therefore properly evaluative.

The second stage is to go beyond simply being evaluative to deriving normative implications, that is, guides for action. It is the nature of social science to generate knowledge, that is, beliefs that are (at least fallibly) true. Social science studies social beliefs and is able to judge their truth or falsity, and it is able to show that there are structures within organizations and society that generate and maintain both true and false beliefs. Thus, where science can demonstrate that a widely held belief is false; identify some social mechanisms that generate or maintain the false belief; and identify actions that would change or displace the mechanisms; then, other things being equal, it can disapprove of the mechanisms and approve of actions to remove them. These arguments are further generalized in Bhaskar (1993).

The upshot of this is that CR provides an underpinning philosophy which both recognizes (against positivism) that the decisions that managers have to make in the real world are inevitably value-laden, and proposes (against interpretivism) a moral standpoint or commitment beyond the beliefs of the individuals concerned. This to some extent aligns it with critical management studies (Alvesson and Willmott 1992, 2012; Alvesson et al. 2009), which recognizes a greater degree of ambiguity between management theory and practice.

The Ethical Conduct of Researchers

While we have been arguing for a greater degree of "bridging" between management as a practice and management as a discipline, there does have to be some distance between them in order that the discipline does not simply become management training—replicating the current practices of management, whatever they may be. We have to be able to analyze, and if necessary, critique, practice, and indeed go beyond it. Yet, especially in terms of management education, it is the management discipline that is training the next generation of managers and so must be responsible for equipping them with more than simply functional techniques. Here, CR can play a major role in

demonstrating the value-full nature of social science and providing secure philosophical underpinnings for an emancipatory management studies.

Also relevant in this discussion is the ethical conduct of institutions and individual researchers. There are a multitude of factors (e.g., emphasis on journal ranking and publications, research funding, impact factor, social outreach, industry partnership, etc.), all of which may have divergent, possibly conflicting implications for management education and research. Pfeffer and Fong (2004) note that in a world beset with financial and managerial scandals, people are questioning the role of business schools in creating or "not eliminating" this behavior. According to Ghoshal (2005: 75), "business school faculty need to own up to our own role in creating *Enrons*. It is our theories and ideas that have done much to strengthen the management practices that we are all now so loudly condemning."

Ghobadian (2010: para. 1) notes that the "inclusion of impact—a measure of change that results from research—in the UK's Research Excellence Framework has prompted renewed attention on the wider purpose of research and renewed questions about why management research outcomes are not used more widely by managers." Ghobadian (2010: para. 3) further notes that "while managers value applicability above all else, researchers value logical precision and empirical validity. And this already large gap may be growing because as research techniques become more sophisticated, they are also becoming less useful for solving the practical problems of managers."

From a CR perspective, it is possible to visualize a complex interaction of different mechanisms in practice which generates certain tendencies in management education and research. For example, the Research Excellence Framework mechanism in the UK (previously known as the Research Assessment Exercise) may be seen as representing certain structural pressures on academics to produce certain desirable kinds of research in desirable forms of research output (e.g., four-star journals or research in priority areas). Furthermore, academics are expected to generate their own research income by writing and wining various research grants.

In their critical review of academic rankings, Adler and Harzing (2009) demonstrate that journal ranking systems are imbued with flaws which have defeated the fundamental purpose of social scientific research—that is, to make sense of the world. The authors highlight the folly of journal ranking, examining a number of detrimental consequences for meaningful work and several constituent academic processes, for example, research, publishing, funding, doctoral training, and career progression. According to Özbilgin (2009), journal ranking is yet another form of discriminatory practice in the higher education sector. Through his critical review of journal ranking sys-

tems, Özbilgin explains why journal ranking should be considered a significant part of the hegemonic structure of inequality in the academic labor process—as part and parcel of white masculine domination that excludes research that may be helpful in understanding the world of work and contribute to meaningful improvements for individuals and organizations.

The Ethical Conduct of Managers

From a CR perspective, management practice does not always serve as a worthy point of reference for academic theorization. Indeed, due to their very focus on profitability and competitiveness, businesses may at times be involved in conduct which may not conform to the ethical expectations or standards of the wider society.

Vranceanu's (2003) study of ethical conduct by managers in the USA (during the internet bubble years 1995–2001) investigates factors that brought about the surge in managers' unethical behavior. The study identifies weak internal control, inadequate incentives related to managers' compensation, and conflicts of interest as key structural causes of unethical behavior. Such behavior was further enhanced by the increased deregulation in the goods and financial markets.

However, changes in regulation and the economic environment may only partially explain managerial misconduct. It is equally imperative to consider the company-specific culture which may play a key role in encouraging or blocking unethical behavior. In the words of Sims and Brinkmann (2003: 246), who studied the Enron case in depth, "the company culture of individualism, innovation, and aggressive cleverness left Enron without compassionate, responsible leadership."

An example of such unethical behavior is the use of children for digital marketing. Health advocates in Australia and also in the UK have raised concerns about this new trend in which children are recruited to market products ranging from junk food to MP3 players to their friends, pushing products to their peers in the playground or on social-networking sites. This process of viral marketing and children promoting products to other children has been described as clever but insidious; children's exposure to unhealthy food messages is particularly unethical in a context of high levels of childhood obesity (Browne 2010).

There is also some evidence that the very process of goal setting, which is a key feature of the dominant pursuit of competitive advantage, may be contributing to ethical issues in organizations. In their study of the role of goal

setting in motivating unethical behavior, Schweitzer et al. (2004) found that people with unmet goals are more likely to engage in unethical behavior than are people attempting to do their best. Further, the study suggests that the relationship between goal setting and unethical behavior is particularly strong when people fall just short of reaching their goals.

It is equally important to consider ethical conduct by management consultants. Fischer (2002) argues that management consultants must satisfy two requirements which also contain two latent points of criticism: (1) the consultant must be able to solve the organizational problem that s/he is hired to solve, and (2) the solution must cohere with the interests of the client people and of the sponsor in particular. The second requirement also has an ethical aspect because of the primacy of the client's requirements and priorities over any alternative view that the consultant might hold.

According to Lapsley and Oldfield (2001), management consultants may be seen as "rational modernisers," "deomons," or "agents of change" depending upon the actual consultant and the viewpoint of the critic. However, one must not ignore the dominantly commercial orientation of management consultancy literature and practices, which in the main focus on strategic and short-term business outcomes with relatively less attention paid to a holistic view of business within a society. Such literature and practices of management consultants in turn serve to aggravate the gap between academic research focused on social aspects of management and actual practice, which at times ignores or gives inadequate attention to the social side of management.

There are thus significant limitations to and concerns about the ethical conduct of management practitioners and consultants. Corporate scandals in the USA, Australia, and elsewhere provide support for Arrow's (1974) claim that without proper regulation, the capitalist economy is likely to produce an insufficient number of positive social externalities. A related implication is that researchers must be critically aware of any unethical management practices and refrain from replicating and modeling such practices as management theories.

The foregoing discussion has highlighted ethical issues in management research and education and the causality of various structural forces in understanding the nature and scope of management scholarship. In summary, while it is possible to find some common expectations among management scholars around the world (e.g., in terms of the quality of their teaching and research), in-depth stratifications of such expectations (or requirements) may generate ethical challenges and different critical realities of management scholarship.

Discussion

This section summarizes possible implications of a CR perspective on producing knowledge which is not only practically valuable but also ethical in its conduct and outcomes. Figure 27.1 offers a schematic summary of our discussion thus far.

The issue of relevance and practical value highlighted in Fig. 27.1 is sufficiently supported by other scholars. In his critical reflection on public sociology, Burawoy (2005) argues that public sociology is concerned with setting up a dialogue with the public outside academia and its form of knowledge as reflexive (p. 17); its legitimacy being based on relevance; and its accountability being to designated publics. Burawoy (2004) juxtaposes "scientific norms" in the professional category with "relevance" in the public category. While this helps us to understand the importance of not conflating a general notion of rigor with a very specific set of disciplinary scientific norms, it is important to recognize more clearly that there are not only multiple modes of enquiry but also multiple stakeholders to be considered, who are constrained by different strategic and ethical considerations. Indeed, the issues raised by stakeholder heterogeneity are quite critical in this context. Wensley (2007) notes that it is very easy for critics to dismiss the specific topic of a piece of research as not relevant where it would be more appropriate for them to ask for evidence that there is significant interest in the research among at least a subgroup of one of the stakeholder communities. However, while there is a need to ensure that management research activities are organized so that there is more engagement with relevant stakeholders, more attention to appropriate research design and methods, and careful and systematic attention to previous evidence and theory, there is also a need to appreciate the effect of differing and sometimes conflicting demands both within business schools and more widely in the university system.

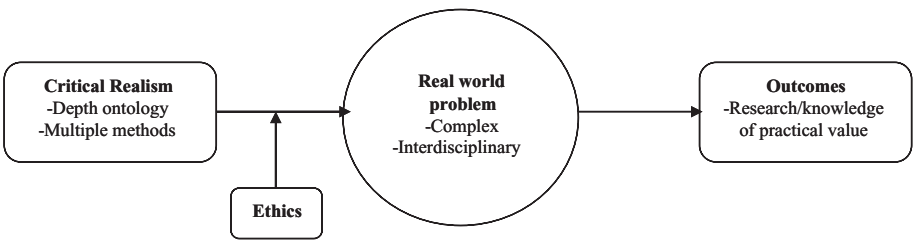

Fig. 27.1 Critical realism may enable ethical and practically valuable research

This almost certainly means that sustainable and ethical improvements will require a significant change not only in economic incentives but also a need to develop new mechanisms and institutions to reinforce the desired changes (Wensley 2007). We have explained in this chapter that a CR perspective has the capacity to ensure that the research agenda is guided by the views of the various stakeholder groups and that there is a more systematic approach to the use of cumulative empirical evidence as well as more recognition of the multifaceted nature of management research.

The history of management theory in a wide variety of domains suggests that theory has generally followed practice. That is, in the vast majority of cases, a practitioner who faces real problems that threaten his/her job and/or organization conceives of a new way of doing things and tries it out. Then, academics come along and study it, create an abstract model to describe it, and publish the model. What academics may be under pressure to do is to publish research that has been conducted within the current paradigms of their fields and—for the most part—according to the restrictive tenets of "the scientific method" as opposed to in-depth inquiries into various business phenomena. Indeed, a significant volume of academic research in the field of business is founded on the issues that can be researched by using experimental designs derived from the hard sciences. The attention of researchers is thus oriented towards selecting research questions, not the needs of practitioners. It is hardly surprising, then, that academic research may at times overlook the questions and problems that really plague practitioners.

This view is also supported by Van de Ven and Johnson (2006), who argue that the quality as well as the impact of research improves substantially when researchers do four things: (1) confront questions and issues existing in reality, (2) organize research as a collaborative learning community of scholars and practitioners, (3) conduct research that systematically examines alternative theories as well as practical formulations of the question of interest, and (4) frame the research and its findings to contribute knowledge to academic disciplines and to domains of practice (p. 815). Van de Ven and Johnson suggest that the above approach (what they term "engaged scholarship") not only enhances the relevance of research for practice but also contributes significantly to advancing research knowledge in a given domain.

Indeed, the ineluctable regulation of reality on our experience implies that research–practice contradictions will emerge when there is an incomplete philosophy. This regulation dictates that despite their stated philosophical positions, researchers often diverge from their theoretical stance and engage in good science and produce good results (Bhaskar 2002: 27–28).

It is possible to identify some important sociological implications of a CR perspective on the said gap between management practitioners and academic scholars. By virtue of its very nature, CR offers a promising approach to considering and integrating sociological implications in management research and theory. It offers a better alternative to the problems and limits of positivist empiricism, on the one hand, and postmodern linguistic constructionism and even hermeneutical interpretivism, on the other. A CR perspective may equip academic scholars as well as managers with mental retooling in order to learn well enough to not simply fall back into the old assumptions, frameworks, and paradigms of management, and to understand, predict, and possibly control (to a limited extent) any gaps that currently exist between knowledge and practice.

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28

Knowledge Management: (Potential) Future Research Directions

Donald Hislop, Peter A. Murray, Anup Shrestha, Jawad Syed, and Yusra Mouzughi

At the conclusion of this Handbook, it is useful to make some overarching comments regarding potential future research directions for the field of knowledge management (KM). Undertaking such an analysis is always a subjective process, as it is shaped by the insights, experiences and perceptions of the individual scholar. Thus, what is outlined here is not intended to be an objective analysis of probable future trends in the field of KM. Instead, it represents our perceptions of what we regard as important issues and topics that could facilitate the development of the field. The remainder of the chapter is structured around these themes.

D. Hislop (✉)
School of Business and Economics, Loughborough University, Loughborough, UK

P. A. Murray • A. Shrestha
School of Management and Enterprise, Faculty of Business, Education, Law and the Arts, University of Southern Queensland, Toowoomba, QLD, Australia

J. Syed
Suleman Dawood School of Business, Lahore University of Management Sciences, Lahore, Pakistan

Y. Mouzughi
Muscat University, Muscat, Oman

J. Syed et al. (eds.), *The Palgrave Handbook of Knowledge Management*,
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Bridging the Theory–Practice Gap

This issue is largely inspired by the conclusion of Heisig et al.'s (2016) analysis on perceptions of the relationship between investments in KM systems and activities and their impact on business performance. This theme also links to a broader issue of the extent to which academic work on KM is linked to and shapes KM practices in the non-academic world.

In terms of a causal link existing between investments in KM and improvements in organisational (or individual worker) performance, this represents one of the canonical assumptions of the KM field. However, Heisig et al.'s (2016) analysis, based on an extensive survey of KM academics, concluded that despite the many claims made about this linkage, further research was necessary to more fully and rigorously substantiate it. Further, this is despite the claims of many papers to provide evidence of such a linkage. There are a significant number of papers whose analysis identifies a link between various knowledge processes (knowledge sharing, knowledge absorption, knowledge utilisation) and various types and levels of performance improvement (such as individual-level work performance, team or organisational innovation). Thus, examples of such work are not difficult to find (for example, Amin and Aslam 2017; Cheung et al. 2016; Han and Li 2015; Henttonen et al. 2016; Leal-Rodriguez et al. 2013; Lee et al. 2010; McIver and Lepisto 2017; Yang 2013). However, arguably, due to the type of data that is typically collected and analysed, there are weaknesses in the claims being made in such papers. The intention here is not to single out any specific writers for making unsubstantiated claims, or having undertaken a problematic analysis, but to highlight the general challenges that exist in attempting to make a linkage between investments in KM, or worker engagement with KM activities, and some type of performance improvement.

In general terms, papers which present data on this relationship use survey-based research methods. One of the biggest challenges is attempting to quantify and measure activities, such as knowledge sharing, which are inherently subjective and ambiguous. For example, in processes of knowledge sharing, where two people interact and exchange some knowledge or information, there are challenges in attempting to quantify the relevance and/or quality of any knowledge that is shared, as well as identifying whether any shared knowledge is used by people in carrying out their work, and finally, whether the use of such knowledge has changed or improved people's work performance in a noticeable way.

These measurement challenges relate not only to the quantification of KM activities, but also to measuring and quantifying the performance improvements

such activities are meant to produce. Whether the interest is in individual-level worker performance, team-level performance, organisational-level innovation or organisational-level performance improvements, challenges exist in measuring such variables. This is to a large extent due to the challenges of measuring performance quality. For example, at the level of individual worker performance, for virtually every job, performance improvement is not simply about increasing the number of times something is done (how many customers served, how many problems solved), but also with the quality of people's work performance. Finding measures to reliably quantify such issues is extremely challenging.

With survey-based research, such challenges are often addressed by collecting self-report data on people's perceptions, such as people's perceptions of their engagement with KM activities, and people's perceptions of performance levels (individual-level productivity). This is the case with virtually every one of the papers listed above, which claim to provide evidence of a linkage between participation in KM activities and performance improvements. In reality, what has been demonstrated is a linkage between people's perception of their engagement with KM activities and their perception of work performance.

Many of these performance challenges arguably arise out of too many individual-level performance metrics. One of the many issues with both KM and related studies of strategic human resource management (HRM) systems is the excessive focus on performance at the individual level. As noted in the Introduction section of this Handbook, this is despite scholarly advocacy for the emergence and complementarity of resources at the level of the human capital resources (HCR) (Barney and Felin 2013; Felin 2012; Nyberg et al. 2014). The basis of this approach is that resources are accumulated and compiled from the individual level to the HCR as firms aggregate up individual knowledge, skills and other skills (KSAOs). Nyberg et al. (2014) suggest that while KSAOs are unique because of the way they are constituted at the individual level of analysis, at 'the collective HCR level, they manifest different types of the HCR such as knowledge based HCR versus a skills-based HCR' (2014: p. 321). The methods by which firms develop dynamic capabilities from the HCR deserves much greater attention in the KM literature despite recent research (e.g., Helfat and Martin 2015) drawing from previous work in the field (e.g., Eisenhardt and Martin 2000). Thus, much of this research has been focused by and large on strategic development rather than KM. One useful question relates to why KM scholars should also shift their attention to dynamic capabilities (DCs). Put simply, if it can be proven that DCs arise from the HCR, then it follows that knowledge stocks and flows (Bontis et al. 2002) are likely to be

transformed. That is, existing knowledge stored and used is not simply exploited one more time; rather, through a process of exploration, new knowledge is acquired that increases a firm's existing stocks of knowledge. This is because, as strategy scholars contend, DCs are fashioned by the way resources are recombined, reconfigured, accumulated, coevolved and transitioned (Dierickx and Cool 1989; Eisenhardt and Martin 2000; Maritan and Peteraf 2011; Ployhart et al. 2014). To us, this sounds very much like a KM transformation process (e.g., see Chap. 24 by Mohsen and Syed in this Handbook).

Similarly, scholars have called for a different focus on social capital (SC) research. For instance, Nyberg et al. (2014), Ployhart et al. (2014) and Ployhart and Moliterno (2011) suggest that 'future research should consider more explicitly the validity of social capital as a socially derived building block of the Human Capital Resource (HCR) that is conceptually equivalent—if empirically distinct—from the psychologically derived KSAOs that have predominated in the HCR literature' (Nyberg et al. 2014: p. 335). Murray (see Chap. 2) suggests that much SC research has focused on highly dependent idiosyncratic environments and the degree to which firms can build trusting relationships in establishing external social capital (ESC) collaborations. Furthermore, the distinction between internal social capital (ISC) and ESC is not well explained in much of the literature. In fact, there is not a seamless integration and transformation of SC resources at the HCR level, because all firms learn and acquire knowledge at different rates, reflecting the reality that both ISC and ESC measurements will be dissimilar depending on the many contexts in which study constructs are used. Similarly, because existing KM research acknowledges the downsides of time and space, trust and commitment in developing ESC relationships (Adler and Kwon 2002; Granovetter 1973; Nahapiet and Ghoshal 1998), SC transactions tend to be consummated over longer periods of time (Coleman 1988: p. 91). Thus, a concept such as ESC cannot be considered at a certain point in time and space as a reliable antecedent of performance (see Murray, Chap. 2). Accordingly, we call on scholars to consider longitudinal studies of SC, how relationships are formed, how they change and how they are maintained over time; more precisely, how they create value given concerns about opportunistic behaviour (Panico 2016). Further, given the many interconnecting ontologies in proximate fields, for example, strategy and Strategic Human Resource Management (SHRM), future research ought to examine the relationship between KM and SHRM, and KM and strategy.

A further challenge with the type of survey research undertaken on these topics is that a snapshot approach is adopted as noted above, with survey data on all topics being collected at a single point in time. With such analysis, while it is possible to identify a relationship between variables, it is not possible to establish any form of causality. Thus, while KM activities and performance levels may be linked, this does not prove that the engagement in KM activities is causing the performance improvement, as the opposite may be the case.

Overall, therefore, one potential challenge for the KM field is to further investigate the link between investment in KM and engagement in KM activities, and their impact on performance levels. The challenges of doing so are not insignificant; however, more comprehensively proving the value of KM activities to organisational or individual performance is important, partly in order to demonstrate the value of KM to the non-academic world. This leads to the related challenge for the KM field: a potentially significant theory–practice gap.

A number of analyses of the KM field suggest that practical utilisation of academic work in the non-academic practitioner domain is somewhat limited; for example, Serenko and Bontis (2013) talk about it having a 'limited direct impact on practice', and Ragab and Arisha (2013) refer to a 'theory–practice gap'. One indicator of this is that as the field has evolved and matured, the level of practitioner involvement in academic publications has declined significantly. More anecdotally, there has also been a significant reduction of interest in the topic among management consultants. Thus, the high level of early interest shown by large consultancies such as KPMG during the early growth period of interest, in the years immediately following the mid-1990s, has not been sustained, with their level of interest in providing KM solutions being significantly reduced. This decline of practitioner engagement and interest has occurred at the same time as the domain has matured into an established academic field of interest.

The risk associated with this level of practitioner engagement is that KM becomes a purely academic field, with limited practical relevance. For a largely applied field, such an outcome would be a shame, as the practical relevance of much academic research in this domain is significant. As the current Higher Education (HE) context is characterised by increased demands for practitioner relevance, engagement and impact, this provides a further incentive to ensure adequate levels of practitioner engagement. Thus, a significant challenge for those actively involved in this field is to reverse this historical trend of declining practitioner engagement, and ensure that the insights developed from academic research in this field are seen as relevant beyond the domain of academia.

The Human–Technology Interface

From the late 1980s until the mid-2000s, the primary focus of scholars and practitioners was on the information technology (IT) side of KM and the related aspects of data processing and storing. This trend continued into the 2000s, with much attention paid to IT to capitalise on knowledge. There was, however, some attention given to other dimensions of KM. For example, in their book titled *Knowledge Creating Company*, Nonaka and Takeuchi (1995) highlighted the need to consider the human side of managing knowledge. Prior to that, Nonaka (1991) had highlighted the role of organisational structures and processes in producing knowledge and creating innovation. However, it took more than a decade before this advice was paid due attention. For example, in his important piece in the *Journal of Knowledge Management*, Bhatt (2001) examines KM by focusing on the interactions between technologies, techniques and people.

Nonaka and Takeuchi (1995) introduce the SECI approach, focusing on socialisation, externalisation, combination and internalisation, which has guided much of the subsequent thinking about KM. The SECI approach focuses attention on the way knowledge is generated among people in order to establish a process to enable knowledge creation, sharing and socialisation in organisations. This is a people-focused approach which is particularly useful to convert tacit knowledge to explicit knowledge.

The future of KM is likely to benefit from the IT and human focus of the previous decades as well as a focus on critical and ethical aspects of knowledge for specific outcome-driven actions in a responsible manner (Chen and Huang 2009; Rechberg and Syed 2013). It is likely to focus on connectivity, collaboration and co-creation, thus integrating the information and socialising aspects of managing knowledge. Instead of discarding IT, the future KM will use technology to assist in socialising, connectivity and collaboration in order to create and co-create knowledge. It will thus make use of several forms of the latest technology, such as artificial intelligence, 3D printing, robotics, wearables and cognitive technology, to enable individuals to share, learn, co-create and co-use knowledge (Fovero 2016).

For example, IBM's Watson system integrates natural language processing and machine learning to understand and analyse various data sources. It has the ability to combine diverse data of artificial intelligence. It analyses natural language and merges it with statistical analysis of vast, unstructured piles of text to offer useful information. Clearly, such a system has a diverse range of applications. For example, in medicine, Watson is being used to conduct robust analysis of vast amounts of information to doctors who would have to

otherwise undertake many hours or weeks of learning to correctly process information (Fovero 2016). Watson for Oncology analyses a patient's medical information against a vast array of data and prescribes a choice of evidence-based treatment. In particular, once an oncologist enters all of the clinical information into the computer system, Watson will then review all of the data and recommend treatment options based on the latest evidence and guidelines. Once the oncologist makes the expert decision, this information may also be sent to the health service provider or insurance company for approval (Doyle-Lindrud 2015). While the final decision still remains with the human, the quick and relevant data processing enables an efficient integration of human and IT-based knowledge. Therein lies the future of KM.

Berry (2013) highlights the importance of individual employees and managers in the efficient and effective use of knowledge. He cites a survey to note that the lowest performers in customer service satisfaction include industries that are expected to have access to the latest technology, such as internet service providers, internet social media, wireless phone carriers and airlines. While this technology–service mismatch indicates a trade-off between satisfaction and efficiency, it also indicates the need for more engaged and skilled employees and managers to use knowledge technology to achieve organisational outcomes.

Berry (2013) argues that organisations with modern technology but poor outcomes may be failing because of their inability to harness the multitude of information that is available to them, for example, to help them understand their customers and provide solutions to their challenges. Berry (2013: para.7) argues:

> Companies have piles of information within multiple channels, locked away in silos—different systems, different departments, different geographies and different data types, making it impossible to connect the dots and make sense of critical customer information.

The enormity of data and the organisational inability to locate, correlate and leverage information across channels ultimately affects organisational efficiency and poses challenges for knowledge workers. This means that KM practitioners will have to start learning about new technologies and will need to have the flexibility to adapt to their job descriptions. Similarly, there is yet another aspect of KM where technologies such as virtual reality may be used to enable individuals to have virtual 'face-to-face' meetings without needing to be at one location. Such technology is particularly useful for sharing or applying knowledge in remote or risky situations such as pipeline or

radioactivity inspections, remote surgery and cost-effective meetings. Videoconferencing through Skype or Videolink is the most common example. Perhaps a future version of such meetings will be offered by 3D hologram meetings.

In the current era of social media, intranet and internet, technologies and databases of knowledge may remain neither unique nor inimitable for an indefinite amount of time. However, the ability of humans to make use of such data and associated technologies is something that will be a source of strategic competitive advantage.

Taking Account of the Changing Nature of Work

The world of work and employment appears to be changing in multiple, diverse, significant directions. First, the ongoing development and evolution in digital technologies via social media, smartphones and tablet computers (among others) are transforming the way people work and communicate. Second, processes of globalisation are ongoing, requiring increasing numbers of workers to travel regularly, work in diverse locations, and collaborate and communicate with collaborators who are geographically dispersed. Third, various changes are impacting on the nature of the workplace, and the locations from which people work. These include an increased use of hot-desking, an increase in the proportion of people who work at home and an increase in the proportion of people whose work requires them to regularly be mobile, working from diverse locations, including while they travel (see point 2). Fourth, developments in automation and artificial intelligence have the potential to transform the nature of many jobs, automating routine tasks, and requiring workers to utilise and collaborate closely with these technologies.

These changes are not only affecting the nature of people's work activities, and the types of skills and knowledge necessary to carry out work activities, but are also transforming the way people communicate and collaborate with colleagues. For example, increasingly fewer workers work full time in static corporate locations, where much communication with colleagues occurs face to face. The relevance of such changes to the domain of KM is that they are likely to impact on the ways in which workers and organisations use, manage and share knowledge. For example, how an office-based worker, who travels little and collaborates largely with local colleagues face to face, uses and shares knowledge is likely to be different from how a worker who is often home-based or mobile, and who is required to utilise a range of information and communications technologies (ICTs) to communicate with their colleagues

and collaborators, shares knowledge. Thus, a key challenge for the domain of KM is to make sense of such organisational change and to account for how it is impacting on the domain of KM.

Following this line of thought, one emerging challenge for KM researchers lies in the area of harnessing business intelligence and analytics in the era of big data, which also has a 'big' impact on knowledge discovery, among other things (Chen et al. 2012). Recent research confirms that the analysis of big data (or any data) using the 'people' dimension may prove to be a challenge due to technology limitations and data privacy issues. Organisational analytics capabilities must be developed so that the strategic impact of human capital can be measured for better KM (Boudreau and Ramstad 2006). However, existing practices of analytics have been criticised for failing to deliver strategic value; for instance, in the area of human resource management, analytics use finance (cost-driven) and engineering (process-driven) perspectives for people management issues (Angrave et al. 2016). Significant issues of privacy and ethics must be addressed, particularly for personally identifiable information, as they could be more vulnerable to information security breaches; for example, a US citizen may be identified based on their gender, date of birth and zip code (Sweeney 2000). Furthermore, given our earlier thoughts on the human capital stock of knowledge, researchers can no longer think of the HCR as a static resource. Given the nature of changes and potential of big data, KM researchers ought to turn their attention to how to realise the opportunities of big data analytics in the HCR and how these big data capabilities are accessible as a complementary set of resources for managers (Nyberg et al. 2014).

There are several opportunities for assimilating big data on people; however, HR analytics based on people may be implausible. Social media and automated sensors collect authentic and relevant data on people (e.g., actual events that people attend) rather than self-reported activities (e.g., lists of events that people may claim or plan to attend). However, real-time, people-centric analytics from automated systems can potentially lead to negative outcomes. For example, when employees were given a target time for order fulfilment in a warehouse management system, efficiency was achieved due to staff performance improvement. However, further analysis revealed that the employees were engaged in unsafe practices in an attempt to meet the deadlines, resulting in a work health safety issue (McAbee et al. 2017).

Key barriers to the adoption of big data analytics by knowledge workers include the consequences of thinking about people in terms of labour cost metrics. The silo thinking within knowledge areas also prevents sharing of knowledge stocks with other determinants of performance (Angrave et al.

2016). For example, in the area of HRM, people data has transparency and transferability challenges, for example, restrictions on migrating employee data across countries for multinational companies (Cappelli 2017). One recommendation is to transform the current people-based analytics model to an analytics model based on KM, such as competence. For example, people knowledge on selection and assessment of IT service management processes for improvement can be automated to develop an organisational capability more transparently, thereby facilitating innovation (Chap. 25 by Shrestha, Kong & Cater-Steel; Shrestha et al. 2015). Therefore, individual competencies can be accumulated to build dynamic capabilities that may lead to a competitive advantage in factor markets depending on how they are used (Helfat and Martin 2015).

To sum up, as a result of compiling this Handbook, we have recognised many challenges from the knowledge–practice gap, the technology interface to the future of work and many more. Future research should seek to address the 'why and how' of KM in practice with a stronger emphasis on robust forms of measurement. Too much emphasis, for instance, on one type of KM, such as homogeneous attributes of individual knowledge linked to performance and/or how knowledge routines lead to better routines, are not only tautological but may offer very little to practising managers. An excessive focus on internalisation or some other antecedent, for instance, without reference to context is often criticised in the literature (Nahapiet and Ghoshal 1998; Hsu and Wang 2012). Similarly, common measurement fallacies are committed when seeking to generalise some empirical studies across industries. It may be more worthwhile for scholars to focus instead on empirically validating the practice(s) of KM within a specific industry before such generalisations occur. For example, it is extremely difficult to generalise the SC construct as a form of knowledge generation across both internal and external organisation functions simultaneously, mostly because both the latter have different causal properties (Adler and Kwon 2002; Hsu and Wang 2012). This Handbook accordingly addresses these and many other contemporary issues of KM by developing new lenses and methodologies by which to measure KM practices. We encourage scholars to consider the excellent chapters of empirical work, related case studies, theoretical reviews and conceptual ideas that are available. However, we also call on scholars to consider the challenges and opportunities for future research as we have discussed here. To this end, we hope that the Handbook provokes much thought within the KM space and serves as a highly relevant and practical resource going forward.

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Index[1]

[1] Note: Page numbers followed by 'n' refer to notes.

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