

Ettore Bolisani  
Meliha Handzic *Editors*

# Advances in Knowledge Management

Celebrating Twenty Years of Research  
and Practice

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# Knowledge Management and Organizational Learning

## Volume 1

### **Series Editors**

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Ettore Bolisani • Meliha Handzic  
Editors

# Advances in Knowledge Management

Celebrating Twenty Years of Research  
and Practice

 Springer

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## Prologue: Book Series on “Knowledge Management and Organizational Learning”

When we decided, with the encouragement of colleagues and friends of the International Association for Knowledge Management (IAKM), to launch a new book series on “Knowledge Management and Organizational Learning,” we had a clear idea of the purpose of this challenge. In our preliminary discussions, we had to consider a specific question: Why a new series? How can it attract the interest of readers, editors, and authors, not to mention publishers? Aren’t there enough journals, conferences, books, and even other series on the same topic?

Although we were aware of the risks associated with a new editorial project, we also found many good reasons to do it. In particular, the book series recalls the mission of the International Association for Knowledge Management which we founded, with nine other colleagues, in 2012: the mission of supporting the development of knowledge management (KM) as a scientific discipline.

Despite its increasing importance in academia, KM still suffers, like any other “new area,” from a problem of “recognition.” It aims to become an independent field, but as it has multidisciplinary roots – from psychology to computer science, from organizational science to business administration, just to mention some – it requires an integration of different perspectives and a robust clarification of its conceptual references. Research and practice often branch off in multiple directions, and no clear consensus on concepts and methods has emerged so far.

So, as scientists and professionals involved in KM, we need unified theories, common approaches, and standard languages that help us see the problem of managing knowledge under the same shared perspective. The way to reach a credible agreement on what we are doing and to set a common ground for our future work calls for a capability to discuss, exchange, and, maybe, contrast our ideas and positions freely and openly. We need a place where we can do this in a rigorous but, at the same time, friendly atmosphere.

This book series is an integral part of this mission. What inspires it is not the acceptance to a particular “school of thought” or “ideological” position, as sometimes happens even in the scientific world. Rather, what inspires it is a vision of KM as a “playground” where there is a lot to research, discover, and innovate, where curiosity, dialogue, and openness to confrontation are the key ingredients.

With the same scrupulousness of scientific publications, but with a broader scope and more relaxed constraints than those that may characterize other editorial channels, the series will put an emphasis on free discussions of new theories,

methods, and approaches; on visions of the future and advances in the field; on critical reviews of recent or past empirical evidence; and on formulating ideas for new practical methods or applications. It aims to offer a constantly updated reference to researchers, practitioners, and also students involved in the field of KM and its application.

To conclude this presentation, here are a few words of acknowledgment for all those who support this initiative. First of all, we thank our publisher Springer, particularly Dr. Martina Bihn, Editorial Director of Business/Economics and Law, and Dr. Prashanth Mahagaonkar, Editor of Business/Economics, who have believed in our project and have supported it with their competence and proactive help. Secondly, we gratefully thank our colleagues of the International Association for Knowledge Management. They have not only encouraged us but have also guaranteed their active support for the success of the book series. Indeed, the involvement of our Association is essential, not only for circulating the information about the series (all updated information about issued books and new calls for papers will be published on the official website, [www.iakm.net](http://www.iakm.net)) but also because members will be in the frontline as contributors, reviewers, and editors.

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## Preface

### *“Advances in Knowledge Management: Celebrating Twenty Years of Research and Practice”*

It can be said that KM has, more or less, 20 years of history. In practice, however, it is virtually impossible, and maybe useless, to find the exact origins of KM. Surely, this “emergent area” of management has many “parents.” Among the most cited authors that are often indicated as “seminal contributors” to KM are Davenport and Prusak, Nonaka and Takeuchi, Bontis, Grant, Wiig, and Spender; however, there is no space here to mention all the others that would also deserve a citation. There are also authors (for instance Polanyi) who, even though they can’t be classified as “KM scholars,” strongly influenced and still influence this field.

Since the early works of these pioneers, a lot has been done. KM has developed, both in research and practice, and although its recognition as a scientific discipline is still debated, it has gained its place in the management field. On the future of KM, there are, however, diverging opinions. In particular, some critics affirm that KM has weak theoretical grounds: ambiguous definitions, inconsistent interpretative frameworks of phenomena, and lack of a shared perspective in a field that is multidisciplinary in nature. Others add that KM is just a “rebotled old wine” that simply takes and recombines ideas and practical methods from past managerial disciplines and approaches. And there are those that affirm that KM practice, despite the huge investments by companies, has a high percentage of failures, and there is also a problem of measurement of benefits and costs.

It wouldn’t be wise to underestimate these criticisms, but it also appears that the popularity of KM is not simply a fashion: the “KM movement” has increased over the years, and this can’t be neglected. There are established conferences, books and book series, and specialized journals; associations of KM scholars and professionals; many documented cases of companies that are successfully carrying out KM programs and investing a lot in them; and even new professions that are explicitly tagged as KM.

It is therefore the proper time to make an appraisal: What is the state of KM? Has it really become a discipline (as its promoters say)? Or is it time to move on to other subjects (as its critics propose)? And, in general, what is left to do? What directions can or should (if any) the research and practice of KM take?



Addressing these questions is the goal of Volume 1 of the book series entitled *Advances in Knowledge Management: Celebrating Twenty Years of Research and Practice*. The volume tells a story of knowledge management's (KM) journey so far. It looks back into the beginnings of KM, unravels its present dynamics, and tries to see what lies ahead. Essentially, Volume 1 aims to capture the *zeitgeist* of KM, celebrates its advances, and positively promises that there can be a bright future for those who embrace it, a future of opportunities for research and practice.

The book represents a structured collection of writings founded on the most recent experience and research pursued by members of the International Association for Knowledge Management (IAKM), their colleagues and students, and other authoritative scholars. We are thankful to all for supporting this project and contributing their time and effort to make this book possible.

The book is organized into three major parts, each containing three chapters. It is designed to permit selective readings of individual chapters or parts of the book, depending on readers' interests. However, readers are advised to first familiarize themselves with the chapters in Part I.

Part I of this book offers a peek into KM's past. Since every good story starts at the beginning, the chapter "[Knowledge Management: Origins, History, and Development](#)" traces the origins of KM and its progress toward economic relevance and value. Part I also includes the chapter "[Knowledge Management Concepts and Models](#)" that reviews some of the most important concepts and models developed in and for KM. Research interest in these concepts and models over the past years is further analyzed in the chapter "[A Descriptive Analysis of Knowledge Management Research: Period from 1997 to 2012](#)" via a descriptive study of top KM publications.

Part II of the book focuses on KM's present. In particular, the three chapters in this second part of the book illustrate KM in action: practices, methods, and approaches adopted by organizations. The chapter "[Knowledge Management in the Public Sector: UK Case Study Perspectives](#)" is concerned with the implementation of KM in the public sector. The chapter "[Supporting Business Managers with Knowledge Management](#)" examines the role of KM in supporting business managers and enhancing decision performance across industries. In the chapter "[Understanding and Improving the Professional Toolbox: Communities of Practice as a Paradigmatic Lesson for Knowledge Management](#)," the main emphasis is on communities of practice, their importance in social learning and knowledge transfer, and their prospects as a KM method.

Part III of the book is devoted to KM's future and proposes a look at new views and ideas. The first two chapters address major issues and challenges for KM research and practice based on the opinions of KM experts. The chapter "[Future Research in Knowledge Management: Results from the Global Knowledge Research Network Study](#)" presents visions and directions for KM's future from a global survey of academics and practitioners interested in KM, while the chapter "[What Practitioners \(Should\) Want and Expect: A Personal Perspective](#)" provides a personal perspective of an eminent researcher on what practitioners should expect

from KM. The chapter “[The Next Generation of Knowledge Management: Mapping-Based Assessment Models](#)” proposes a new KM value assessment model showing where to go from here and how.

We hope that the book will help readers better understand KM and appreciate its benefits. It is especially our wish for the book to help researchers get a clear picture of what lies ahead and how to get there. It is also hoped that the book will help practitioners to develop suitable KM solutions that will turn their intangible assets into tangible outcomes. With many researchers and practitioners working together in a holistic and systematic manner, we trust that the field will continue to evolve and mature.

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## Part I

# Analyzing the Past

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# Knowledge Management: Origins, History, and Development

John C. Spender

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## 1 What Is KM?

Larry Prusak, an engaging polymath who knows plenty about KM's origins and history, and had a hand in introducing it to the wider world, argued its history and rapid development could be attributed to three trends: globalization, ubiquitous computing, and the attention to the knowledge-centric view of the firm (Prusak 2001). Hence KM's most obvious feature – it is multi-faceted, many-sourced, and several-langued and not yet a coherent academic field with an established body of ideas, methods, and target phenomena. Its pluralism has created considerable confusion that challenges those trying to map the field (Earl 2001; Mehrizi and Bontis 2009); indeed many think it no more than a passing fad, old wine in new bottles with no insights not findable elsewhere in simpler language (Hislop 2010). I am sympathetic to Prusak's characterization, and will lean on it, but also believe his story can be re-framed within our evolving insights into human action, especially within organizations. At bottom, KM means managing the relationship between knowing and acting in organizational contexts, part of which is managing the processes of knowing and learning towards organizational ends. Organizations are not new, so neither is KM; Roman and Florentine bankers kept accounts; Josiah Wedgwood kept a close watch on production costs. Computers and statistics have added new flavor but we should not consider computing a 'cause' of KM; after all, computers only do what we tell them to do, they are KM's powerful tools not its

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I appreciate the help of the Editors and two anonymous reviewers in the development of this chapter.

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causes. So we need to look behind Prusak's categories to clarify the knowing – acting relationships he intuited between globalization, computing, and the knowledge-based theory of the firm. The last is especially important for not all writers see KM as narrowed onto organizational contexts; yet it is crucial to see KM cannot and does not embrace the entirety of human knowing. It always hinges on a 'theory of the firm', a boundary concept that separates organizational knowing from broader epistemological matters. Inattention to this boundary is the primary source of our field's confusions. The confusion is most obvious when KM writers set out by trying to define human knowledge – instead of starting by defining the firm as the context that gives 'knowledge' its particular and manageable meaning, and establishes how KM might create economic value.

The most familiar theory of the firm (ToF) is of the firm as a rationally designed goal-seeking mechanism to transform inputs (factors of production) into outputs, goods and services. Such mechanisms generate and consume data about their production processes as well as about the markets in which the relevant factors of production are acquired and into which the goods and services produced are delivered. Data is essential to managing this type of firm, and is all that is needed. If the mechanism model was the only ToF of interest to practicing managers KM would be never be more than the timely generation, collection, movement, storage, analysis, and delivery of data about the firm and its operations. Indeed the vast bulk of our literature takes this ToF for granted, even as it is seldom spelt out. It follows that if the mechanism model has been adopted KM cannot be distinguished from IT or what used to be called EDP (Electronic Data Processing) or, before the computer age, 'managerial accounting' – which would take us back as far as the Ancient Egyptians, and beyond. With a data-oriented mechanistic definition in mind, many authors argue KM's objective is to make the firm's data-handling more efficient, in particular to discover, collect, and protect data that is 'hidden' or 'lying around' overlooked in the organization. There is nothing 'wrong' about this re-labeling, except the term 'knowledge' is not as readily pinned down as the terms 'information' or 'data', so re-labeling EDP and IT as KM introduces considerable and unnecessary confusion; indeed anything that might be said about improving the utilization of the firm's data can be said more clearly by avoiding the term 'knowledge'.

Knowledge is an exceedingly challenging concept, yet the urge to talk about it in our 'knowledge economy' seems irresistible because the term 'data' does not address all our concerns (Powell and Snellman 2004). A glance through the KM literature shows that our field's defining ambition, why it looks beyond EDP and IT, is to reach beyond the data-framed IT discourse towards other aspects of real world organizational practice – though the authors who take this beyond-IT position are in the minority. Nonetheless the rest of this chapter pursues this minority view in the belief that KM is not simply one of accounting's or EDP's or IT's subfields but is a discrete intellectual discipline whose boundaries and problematics have not yet been adequately articulated. Our challenge is to do this in ways that clarify rather than confuse, and to show what might be achieved thereby. In short, we need to



know what KM is before we can discuss its origins, history, and development profitably.

Again, many authors start out with definitions of ‘knowledge’, and a common proposal is that knowledge embraces both explicit data and ‘implicit’ or ‘tacit’ knowledge that cannot be treated as data (Mehrizi and Bontis 2009). This is an epistemological distinction and drives what these authors mean by KM. Others use different knowledge-typologies or ‘epistemologies’. Data, information, knowledge, and wisdom is popular – and there are several others evident in our literature. If the resulting confusion could be cleared away we would see that there are several different notions of KM, each contingent on the particular author’s chosen epistemology or definition of ‘knowledge’. Conversely, it is clear the majority of the field’s writers define knowledge as data, and this determines *ex assumptio* what they mean by KM – part of IT. In contrast, this chapter argues (a) managers’ concerns cannot be limited to data alone, and (b) there can be no satisfactory managerial definition of ‘knowledge’ and that it is ‘epistemologically naïve’ to think so. The struggle to establish an overarching unproblematic epistemology has been going on for millennia, and is not going to be over any time soon. A better way to grasp KM is to recognize and exploit the variety of epistemologies (notions of knowledge) already available to us. Thus to try and base an explanation of KM on a single definition of knowledge is simply a strategic error; it cannot work, and our discipline’s several decade history of failure should have made this blindingly obvious – the data is in. The alternative is to focus on the ToF that defines the type of knowledge to be discussed – to think ‘firm-first’. We have to know the firm before we can know the kind/s of knowledge it requires to exist and prosper. To repeat, if managers’ favored model of their own firm is a rationally designed machine, then data is the only kind of knowledge needed and KM is part of IT.

The most common move beyond the mechanistic ToF is towards a ‘learning organization’. The focus shifts from ‘knowledge utilization and retention’ and onto ‘knowledge generation’ (and ‘forgetting’). The mechanistic model does not lead to interesting explanations of knowledge generation – we know of no machine that churns out new knowledge as its crank is turned (though many write about ‘innovation management’ and Thomas Edison’s ideas about planned innovation remain relevant and interesting). Machines transform, they do not create. Likewise the extensive literature on ‘organizational learning’ is not as helpful to KM authors as it might be because it does not successfully disentangle (a) the drivers of the knowledge creation process, such as environmental change or personal ambition, from (b) the processes of knowledge creation and (c) knowledge distribution (Dierkes et al. 2003; Easterby-Smith and Lyles 2003). A great deal of KM (and innovation management) is about ‘knowledge sharing’ rather than knowledge creation. It is also not clear whether it is organizations or people that learn. To propose an organization that can learn – perhaps by changing its ‘organizational routines’ or adding to its ‘capabilities’ is to propose a specific ToF that is (a) not general, and (b) needs to be spelt out if it is to avoid mere tautology as in “organizations learn by changing routines” where an organization comprises nothing but routines. The organizational learning (OL) literature is not yet helpful on

these matters and its KM practice implications are not clear. An alternative approach presumes only individuals learn, so implying a specific model of the individual that differs fundamentally from the mainstream notion of 'rational man'. But the OL literature is not conclusive on this 'ontological' point either nor does it give adequate attention to the extensive literatures on developmental psychology and educational theory that treat human learning as their research topic. Again, rather than stand KM on a definition of the learning individual, we might do better to stand it on a specific ToF that captures our intuitions about this particular firm's practices.

So long as knowledge creation implies direct movement from a state of ignorance or 'knowledge-absence' into a state of knowing or 'knowledge-presence' there is little more to be said beyond "Do it!". Whether organizational or individual, useful models of learning demand some specification of alternative modes of knowing, transitional between not-knowing and knowing. Many authors presume experience, something that happens while in a state of mindful action, leads directly to knowing. Others look to learning from others, or to reformulating knowledge already in mind, or to intuition, inspiration, or revelation. All these models admit knowledge-as-data but also point towards other modes of knowing. Clearly attempts to define multiple types of knowledge are not going to succeed where defining a single type fails, and the challenge here is for professional epistemologists. The path for KM authors, as always, is to hinge off their chosen ToF and leverage from their far-from-complete knowledge of the firm and its modes of knowing. If the author's intent is a KM system for a learning organization the result will not be the same as if it is for a mechanistic firm. The firm's strategic choices determine which ToF is most clarifying for we know there is no single 'one best way'. Strategic choice is always necessary and the resulting firm is unique and particular in strategically important ways. The mechanistic and learning models are only two of a larger pool of ToFs strategists can choose from. Thus the KM author's hope is less to fully model and determine the firm's design and operations than to gain useful practical insights into managerial practice that are not revealed by the simpler ToFs or KM notions. For instance, if the particular firm's competitive situation rewards learning then management must pay attention to managing knowledge generation, memory, and forgetting, and not merely focus on increasing efficiency by discovering and handling the firm's data better. Alternatively, if the competitive spoils are going to those such as the large pharma firms whose strategy is to safeguard their existing knowledge, in exploitations rather than explorations, a different ToF is implied – and this leads to a different KM. In general, an organization's epistemological problems always match its strategic problems – they are part and parcel of each other. But, crucially for KM authors, they are on surer ground analyzing a particular firm's strategizing than when grappling with the fundamental epistemological problems that engage professional philosophers. We are likely to have a better tacit sense of how to build and manage a 'learning organization', and analyze its knowledge requirements, than we have of the epistemological challenges of developing a scientific theory of organizational learning. "Making better use of the firm's existing data" is transformed into "Managing the

forms of organizational knowing necessary to bring this particular firm's chosen strategy into being." But while taking a 'firm-first' knowledge-oriented approach opens up new models of managing, it demands enough engagement with epistemology to illuminate the kinds of options available. Only then can we look at the strategic KM implications of alternative ToFs and begin to understand KM's origins, history, and potential.

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## 2 Some Comments on Epistemology

Epistemology is the branch of philosophy enquiring into the nature and scope of human knowledge so, given our field's commitment to using the term 'knowledge', some epistemological homework is unavoidable. First, there are many epistemologies; no single one suffices if we are to avoid dogma, the claim to know for sure. We cannot avoid pluralism if we are to engage the real world, admitting our knowledge weaknesses. We advance whatever knowledge of the real world we have in hand through critique, so every epistemology calls for another from which to critique it. The epistemologies most familiar to Western writers are (a) positivist or 'objective' versus (b) interpretive, which some label 'cognitive lenses'. Both circulate in our literature, differing but mutually informing each other. Second, as noted above, the ToF adopted separates KM from epistemology *in toto*. KM is about firms and there are several ToFs. Thus doing KM requires choices – of an epistemology (theory of knowledge) and of an 'ontology' – definition of the entity known, and of a ToF. The last is crucial. But understanding the differences between ToFs requires attention to the different epistemologies and 'knowledge flows' within them. Without addressing the full range of current epistemologies – which would include rationalism, positivism, critical realism, apriorism, constructivism, idealism, and so on – we can illuminate the KM writer's epistemology-choosing process by distinguishing an objectivist approach from a subjectivist one (Hislop 2013). The first presumes all true knowledge is a representation of a rationally constructed and so knowable external reality – reality being the sum total of everything knowable perhaps. Reality's nature and processes lie 'out there', beyond us, independent of and unaffected by our thinking and doing. The second proposes knowledge as more internal and human; what we generate within our consciousness to engage our world more effectively in pursuit of our goals and desires. The first inclines to thinking of knowledge as 'object' – possibly 'intangible' – but nonetheless separable from the conscious 'knower', because its 'truth content' is determined by the reality 'out there'. The second inclines to knowledge as an indicator of the on-going processes of applying our consciousness (what lies 'in here') to our lived situation (what we experience of an 'out there').

The first approach is comfortable for those trained into positivist ways of thought, while the second is much less so and so strikes many as inherently radical – even absurd. The bulk of the KM literature presumes the first – for which there are many possible explanations, such as scholarly tradition, teachability, publishability, or other professional comforts in our obviously positivist era. Unfortunately there is

a grave downside, for the positivist literature has a defect potentially fatal to KM's grander endeavor; it offers no compelling justification for using the term 'knowledge' in lieu of well-defined science terms such as 'theory', 'observation', 'phenomena', or 'discipline' – whose truth content derives from their interaction. Those attracted to the objectivist view should turn first to the scientific method, for it surely bears on whatever we mean by knowledge and its generation. The scientific method's content is lost when its terms are condensed into 'knowledge'. Likewise, positivism-inclined writers who use the term knowledge but stray beyond the bounds of the scientific method are not likely to have a productive experience. Yet conversely, if they stay within those bounds, they have no place for the term 'knowledge'. Note, for example, how little is lost from the IT-oriented literature when the term 'knowledge' is replaced by the term 'data', which is relatively easily defined and fits into science's objectivist epistemology – data can be contrasted with theory and hypothesis.

Those who think of knowledge as tentative scientifically validated representations or justified beliefs about an external reality, do better using terms like theory, hypothesis, test, validity, and so on; any use of the term 'knowledge' is simply confusing. Note there is no knowledge-in-general; scientific knowledge is always of something specific. So to say "A has knowledge of B" is to say nothing until the statement is supported by scientifically validated and falsifiable theory and evidence about both A and B. This shows how we often talk sloppily and unscientifically of 'knowledge' and 'knowing'. It seems paradoxical that many of KM's positivist writers make comments and claims about the nature and impact of knowledge that are so obviously unscientific and un-falsifiable; especially in statements like "organizational knowledge is the key source of competitive advantage", which is completely vacuous. In contrast, the claim that "organizational data, or organizational routines, or organizational capabilities are the source of competitive advantage" may be testable inasmuch as forms of knowing other than data, routines, and capabilities are implied even if not identified. Saying "KM is any process or practice of creating, acquiring, capturing, sharing, and using knowledge, wherever it resides, to enhance learning and performance in organizations" (Swan et al. 1999: 669) is empty language play. Absent workable definitions, the statement is purely tautological, turning on whatever the terms 'knowledge', 'learning', 'organization', 'performance', and KM are taken to mean. The bottom line is that the term 'knowledge' can only be used scientifically to point towards the particular body of theories and observations that comprise that science. 'Knowledge' is not a term within any science. This implies KM cannot be fitted into any 'science' of managing and one reason why the KM literature stands so obviously apart from the mainstream managerial/organizational research that presumes management can be a science. But, treating this statement as a plus that points to an opportunity, we can argue KM's promise is to go beyond the limits of the scientific method to discuss aspects of managing that cannot be discussed within 'management science'; most importantly, knowledge and value creation.

The subjectivist epistemological approach is no less challenging for it excises what many regard as the scientific method's greatest strength, the deployment of

objective testing to separate ‘scientific knowledge’ from mere opinion. We see another ‘knowledge paradox’. If one adopts the objectivist view, there is no justification for using the term ‘knowledge’; so ‘knowledge management’ is meaningless on that account. The scientific method dictates whatever one might mean by ‘knowledge generation’, ‘knowledge acquisition’, and ‘knowledge transfer’ and separates these terms from mere opinion. Note however the scientific method is anything but simple, and much debated by professional philosophers of science. But if one adopts a subjectivist view it is not immediately obvious there is anything meaningful or valid to be said – about anything, let alone about ‘knowledge management’. Anything goes if we have no truth criterion. Can anything in the subjectivist approach be saved and used as KM’s foundation? This chapter argues (a) yes, and (b) this is KM’s real potential – to recover from the damage done by the positivist myths about how science is done and grasp the real management work of creating firms and running them.

The Ancient Greek philosophers explored these issues thoroughly and we can learn much from their labors. Rather than anticipate modern science by thinking of ‘knowledge’ as about ‘external reality’ they explored the different ways in which they considered human beings seem to ‘know’ – by which they meant attend to the personal relationship between thinking and acting so as to act ‘knowingly’ rather than ‘mindlessly’ or against ‘proper knowing’ – which drew in the moral and ethical issues as well as matters of faith. Note the parallels to KM’s agenda of relating thinking and acting. But the Greeks’ ambitions were grander; ours are more realistic and modest. Although there are aspects of an external unchangeable ‘reality’ in their term ‘Form’ or ‘essence’, the Greek epistemologists considered many other modes of human knowing – such as *techné*, *metis*, and *phronesis* variously translated as ‘know how’, ‘street smarts’, and ‘situationally appropriate action’. Their list is quite long. Note too how their approach is partial, like the partial views of the seven blind men touching the elephant while none know its entirety. This is the ancient metaphor for our bounded rationality, our inability to see things ‘as they really are’. In a subjectivist epistemological paradigm ‘knowledge’ refers to the interplay of these different and contrasting modes of personal knowing. It alludes to personal experience as it looks backwards in time, and to our need to make strategic choices as it looks forwards. Our knowing remains subjective because there is no way to ‘step outside’ knowing to observe it ‘objectively’ (to reach an Archimedean ‘fulcrum’ from where everything can be seen ‘as it is’). Another way to illuminate this paradox is by asking, “Even if we were able to generate a positivistic definition of knowledge, would that be more knowledge, or meta-knowledge, or something else?” Taking up a subjectivist or knower-centered epistemological strategy the Greeks were able to (a) separate what is known ‘in here’ from reality ‘out there’, the elephant trap into which positivist epistemology falls as it conflates these and loses the knowing person, and (b) find a way of talking intelligently about knowing as an interplay of discrete and experienced modes, none comprehensive, all partial. The Greeks’ epistemological strategy lives on with those who use the explicit-tacit distinction. Positivist writers dismiss this, presuming tacit means no more than poorly expressed positivist knowledge of the real, their kind of

knowledge, that is going to be restated more scientifically in due course. In contrast, those in the subjectivist camp see explicit knowledge as tentative inter-subjective discourse about a shared world, with tacit knowledge as equally tentative but shaped by the private subjective experience of living. The explicit-tacit disjunction can then be deployed to talk informally about knowledge generation – as Boisot and Nonaka & Takeuchi did – modeled as the under-determined outcome of an interaction of these alternative types of subjective knowing. Because both are defined as bounded, they leave conceptual space for the new knowledge generated by their interaction.

The main point here is to appreciate our literature encompasses two distinct epistemological projects or ‘paradigms’ – one positivist, the other subjectivist. When we do not attend to their differences and interactions KM gets mangled in mutual confusion and distaste. The vast majority of KM writers identify with the positivist project, are scientifically disposed, and focus on extending the profitable application of data-handling computer systems. But these writers have not managed to escape IT. The computer’s correlate to reality is its universe of logical statements; it defines reality as computability. Our lived reality is very different, so the computer-oriented KM writer’s principal concerns are about the relationship between the reality within the system and our social reality. There is an academic ‘trick’ here; when the writer presumes human beings and social reality are fully rational the problems of the relationship are defined away and the system’s users become part of the computer system. The universe and everything within it are defined as computable. The activities within this system are purely data-oriented; collecting, analyzing, and acting rationally on the data provided. But, as we have seen, there is no place for forms of ‘knowledge’ that stand outside science and computability. Another way to put this is to see the positivist KM project as building an all-encompassing computer system, a clockwork universe that excludes and denies all other modes of human knowing, especially of the social and personal realities we experience. If we presume people are as rational as computer systems we have no problem getting them working together, no need for the term knowledge, and no KM project to be discussed – it is all IT. There is no space for emotion, faith, or morality – a bleak inhuman world indeed. If, in contrast, we presume people are not able to meet positivism’s ‘rational man’ standard and so do not conform to this model, then we see doing KM obliges us to go beyond positivist epistemology and science. Or, to be more precise, as we admit neither people nor organizations conform to the fully rational model we begin to scope out KM’s true challenge. It lies in finding modern ways to implement the Ancient Greek’s strategy, but at the level of the organization by, for instance, making these objective and subjective approaches complementary in the interest of understanding organizational practice better – understanding how the KM writer’s chosen ToF works.

To reiterate, much of the KM literature presumes one or other epistemological approach can be adequate on its own. This is methodological naïveté for the knowledge paradoxes noted above show it is crucial to interplay the different paradigms of partial knowing. Consequently no single approach can be fully separated out or used to generate our disciplinary process. The productive interplay

of objective and subjective paradigms is already familiar to most academics through the interaction of qualitative and quantitative methods of empirical research; (a) the open-ended search for suitable data categories followed by (b) statistical analysis of evidence gathered within them. Thus Popper argued the scientific method does not reveal the real's true nature; at best it drives those within a discipline to engage in continued experimentation and peer review to police, falsify, modify, and settle on its provisional truths. Note how experimental practice binds the subjective and objective paradigms in potentially useful ways – suggesting practice itself as a third paradigm or domain of human knowing indicated by the term ‘tacit’. Knowledge, this third paradigm suggests, should be seen as the capacity for skillful practice rather than anything in mental domain. Academics point to methodology as their skillful practice. There can be no deterministic theory of method, for then there could be no growth of knowledge.

Attending to practice opens up a new category of ToFs. In place of the firm as a bundle of economic resources, a mechanical design, a conceptual model implemented, or a cranking machine, the firm is re-defined as an integrated community of skillful practices. Of course, practice is as complex a notion as knowledge, so this may be just another tautology. But we can contrast skillful practice against both mindful and mindless practice. Many presume good practice is, or should be, the mindful implementation of good theory or at least the best knowledge available. Likewise what is learned from practice is, or should be, known unambiguously, so that experiment proves decisive. Note how these assumptions excise practice from the discussion. Keying the meaning of practice off theory denies all aspects of experience that lie beyond what is known by the mind. Polanyi's notion of tacit contests this and points toward those aspects of practice that lie beyond the mind but can be observed as skillful practice. Note also that we cannot capture or express the totality and immediacy of practice, there is always an element of “You had to be there to understand” (Tsoukas and Mylonopoulos 2004). Similarly as Hayek noted, important ‘here and now’ aspects always get left out of an analysis (Hayek 1945) – Peirce used the term ‘indexical’. Practice is indexical, a series of fully experienced instants. Explanation, on the other hand, requires language that, because it always stands on generalities, must leave some of the indexicalities of practice behind. The uniqueness of practice cannot ever be fully articulated in language, a profound epistemological issue if we want to talk about the firm as a value-generating practice.

In summary: what can KM writers gain from this kind of epistemological discussion? First, acquire an appreciation for the unfinished and maybe unfinishable epistemological work required on the term ‘knowledge’, and thereby learn not to depend on the ‘knowledge’ notion alone. Second, that epistemological choice is unavoidable in KM projects, it comes with using the term knowledge. Third, KM projects will always lie outside the full rationality of the IT realm precisely because they connect to people and organizations that are ‘boundedly rational’ rather than computer-like. Bringing human beings into the discussion brings in bounded rationality. Human knowing is utterly unlike a machine's knowing, just as organizational knowing differs from personal knowing because organizational life is

purposive in ways much of one's own life is not. Fourth, that organizational knowing can be usefully separated into three paradigms: objective, subjective, and skilled practice (data, meaning, and skilled practice (Spender 2007)). The first two can be captured in language, the essence of practice cannot. So, fifth, inasmuch as organizations cannot be understood within any single epistemological paradigm and KM is about managing the relationships between human knowing and organizational practice, KM must always embrace all three. It follows that the resulting discussion is always non-rigorous, under-determined, inconclusive, and open to generating surprises. Sixth, and perhaps most important, the KM analyst must recognize s/he is also an in-the-world practitioner and so does well to ground the analysis where her/his practice-based intuitions are soundest. Along these lines those inclining towards positivist thinking look to theory; anything puzzling provokes theorizing. Those inclining towards experience as the source of knowledge focus on individuals – leaders, strategists, entrepreneurs – and their Will. Those prioritizing skilled practice look to the firm as lying beyond both theory and Will, seeing it as a community of collaborative practice; the key to the last being the purpose of the practice. If purpose is not clear the processes of choosing epistemology, ontology, and ToF grind to a standstill.

With this sense of the epistemological issues in hand we can get back to Prusak's categories. Their connection lies in his concept of the firm, which Prusak presumed to be a "coordinated collection of capabilities". Though he did not clarify what these terms meant, it is clear that his notions of KM and its potential are held together by his considerable personal experience of firms, of managing them, and of consulting to them. He advances no theory or data, no leader-driven hagiographic model – the way most speak of Apple Inc. as a manifestation of Steve Jobs. Likewise his later discussion of 'proxy measures' of KM effectiveness implied no prospect of 'objective' knowledge metrics, a hopeless wild-goose chase, and argued to the contrary, that organizations must develop their own proxy measures that reflect that particular organization's practices and achievements against its goals. Prusak's indications did little to help those managing KM projects, they were more cautions than prescriptions. He concluded: "(KM) is a movement, a reaction to technology hype. There has been too much focus on technology, too little on knowledge. KM is about how companies know what they know, how they know new things, and what can be done to evaluate and transfer new knowledge. What forms does knowledge take? Those are still open questions, and we're still learning" (Allerton 2003: 36). Prusak is not the only writer in our field worth reading, of course; he acknowledged Nonaka and Davenport, and there are many others. Yet Prusak stands out from the pack by letting his experience and intuition speak louder than his considerable scholarly, technical, and computing expertise. In this way he reinforces this chapter's argument that it is safer to ground KM practice on one's intuitions about a particular business's indexical practices, warts and all, than on ever more complex computing techniques.

In the section that follows I illustrate how to read some of the currently available ToFs for their KM lessons. The chances of a successful KM project turn on grasping the firm's ToF or what many now call its 'business model'. Put more brutally, if the



analyst does not understand how the business works s/he is not likely to do useful KM. KM success does not begin with solving the epistemological puzzles around knowledge but with understanding the firm's specifics and indexical knowledge processes. This seems so obvious that it is scarcely worth mentioning, yet yesteryear's firm-first imperative is scarcely mentioned in our literature today. Equally, beginning with the firm is no panacea. Not all KM writers know that there is no general tenable ToF; they slip unwitting into the mechanistic model as if it were the only one. There is no doubt the model is common. But it has a fatal weakness. It cannot explain profit and how it arises. Economists know there is no established model of the profit-generating firm. Yet firms only prosper when they make profits and most managers presume the point of KM is to enhance profitability, which makes the returns to KM interesting. Doing KM may be mere fashion, as many authors note, but at bottom it is about enhancing profit. In which case KM authors should treat the mechanistic model with extraordinary caution for it cannot be the basis on which successful KM projects can be built. It may be easy to explain and attractive to academics, but it misses the managers' 'main event'. Note making a profit should not be confused with minimizing losses or waste. A firm's KM project may well be directed towards making better use of the firm's 'knowledge assets', but that is not the same as engaging the firm as a profit-generating entity. This chapter's firm-first approach harks back to the 1960s EDP notions of 'systems analysis' that began by observing and then rationalizing the firm's existing processes. From this point of view, as Prusak noted, the history of KM is a pushback against BPR and the excessively mechanistic modes of corporate computerization it helped introduce. It also reflects managers' sense of the importance of bringing people back in; computerization must support the people remaining even as it displaces many.

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### 3 Other ToFs

If KM is to be a 'firm first' practice then KM authors need better knowledge of pool of business models available for them to choose. Organization theory offers models beyond the mechanistic bureaucratic one – the firm as an organism, a brain, a network, a culture, a psychic prison, and so on, marvelously laid out in *Images of Organization* (Morgan 1997). The weakness of Morgan's analysis is that it pays insufficient attention to the concept of the firm as a boundary between life within the firm and life outside it – and thus to the boundary between KM and epistemology. The boundary is clear in a bureaucracy for those engaged fill precise roles marked by precise rules, accountability, performance criteria, and so on. The knowledge implications of the bureaucratic model are relatively straightforward, so it provides KM project builders with a fairly solid foundation. But the model's fatal flaw, as noted above, is that it cannot explain profit and value-creation; so it is more or less irrelevant to major KM projects for firms in a competitive environment. When it comes to organization theory's other models their KM implications are vague at best. We have yet to discover the secret of life so organic models are

seldom more that rhetorical devices to advance their author's biases; brain notions likewise. The cultures we see around us tolerate significant diversity, so the notion of boundary dissolves when we think the firm a culture. Psychic prison is a memorable metaphor, but again cannot be modeled without a full model of the human psyche. Network is the metaphor of choice these days, but the notion of boundary threatens to disappear entirely unless, of course, by network we mean computer network – wherein every element has to conform to a shared notion of computability. Thus the knowledge nature of a network is clear when the network elements are rational devices, utterly obscure when we mean social network. The Internet does not generate knowledge and cannot be itself a source of profit – entrepreneurs use it to actualize business models that create value in the social world, exploiting many different kinds of value, as the contrasts between, say, the Sabre booking system, Bit coins, and Facebook illustrate.

As noted earlier, the organizational learning literature has yet to offer models substantial enough to be used as for practical KM design, though there are two notable attempts – Boisot's Social Learning Cycle (SLC) and Nonaka & Takeuchi's SECI model (Boisot et al. 2007; Nonaka and Takeuchi 1995). These are often misunderstood and are not widely regarded as at the core of the organizational learning (OL) literature. Both presume a similar knowledge-typology and ToF, seeing the firm as a body of different knowledge types that, when interacted, would lead to knowledge creation. Boisot extended the explicit-tacit distinction into a three-dimensional I-Space by adding (a) diffused within the firm versus undiffused and (b) abstract concepts versus concrete empirical data. The KM system pushes or rotates organizational knowledge through the I-space producing a 'knowledge gain'. The best way to understand Boisot's model is to see it as a 'knowledge engine' that transforms the 'knowledge work' involved in moving the firm's existing knowledge around the firm's SLC into new knowledge (Spender 2013c). It reverses the engineer's notion of an 'engine' that transforms energy (gasoline) into work (moving vehicle) as the SLC transforms organizational knowledge work into new organizational knowledge. The managed interplay of knowledge types goes on as long as the firm has the motive energy needed and chooses to expend it in this way – versus expending that energy on exploiting what the firm 'already knows'. The strategic implication is that if management is unaware of the different kinds of knowledge within the firm, and of the value of driving their interaction, the firm will lose knowledge and die an 'entropic' death. The practical KM implications of the SLC are difficult to divine, though work continues at the I-Space Institute at Wharton.

The SECI model is similar, but Nonaka and Takeuchi only extended the explicit-tacit distinction into a two dimensional space demarcated by (a) knowledge type and (b) organizational location (top management versus R&D lab). Through the motion of the SECI engine the tacit product-based knowledge being generated in the R&D lab gets transformed into explicit knowledge made available to top management's resource allocation process where they balance knowledge generation and exploitation, and between profit and further research investment (Spender 2013a). Again the practical KM implications are difficult to divine, though work

continues at Hitosubashi and elsewhere. But the bottom line is that neither organization theory nor organizational learning theory yet provide workable business models KM authors and project managers might use.

Micro economics offers a number of alternative ToFs – transactions cost theory, principal-agent theory, nexus of contracts theory, property-rights theory, and so on. It is useful to see these as the economics profession's responses to Coase's charge in his 1937 *The Nature of the Firm* that economics has no tenable ToF (Coase 1991a). Coase's own intuitions were that the essence of the firm's nature lay in its chosen mode of subordinating employees to managers. At first sight this sounds like naked managerial power, an echo of bureaucratic theory. But Coase was also talking about law – his insight is into a more complex situation that includes the legal apparatus behind both the firm's labor market and its employment contracts. The latter, of course, are 'incomplete contracts' quite unlike the 'spot contracts' of equilibrium economics. Coase intuited managing through the interplay of legal 'reality', people's preparedness to enter into incomplete contracts, and the exercise of firm-specific managerial power. The KM implications are to see the firm as both a bureaucratic device and a socially and historically situated legal one, the latter having KM implications corporate and labor lawyers know well, needing effective legal information systems to manage their part in the business. Some of the KM literature considers legal systems but more likely designed to support law firms and practices than the normal business firm's corporate lawyers or human resource management departments.

In contrast to the discussion in micro economics and strategy there is little comment about transactions cost theory or principal-agent theory in the KM literature, in part because there is little attention to ToFs and their management implications; in part because micro economic theories do not strike most KM writers as enough about real firms to be worth considering. This is a mistake, obviously, but the micro economic discussion requires an unpacking that KM authors find overly challenging. It may not be obvious that micro economic theories manifest an intellectual theory-building strategy that is notably different from that used by organization theorists. The latter try to grasp the firm *in toto*, as an ontological entity. The micro economists are more modest, trying to theorize only an essential aspect of the firm's nature; like the blind men, they seek part of the firm's essence and do not pay attention to the firm as a whole. They call this 'getting inside the black box'. Transactions cost theory begins with the firm's 'make or buy' choices. Coase got to thinking about these because he spent 1932 touring the US on a scholarship, with excellent letters of introduction to senior business people, listening to what they thought important (Coase 1991b). His firm-first strategy led him to see that while business people had ideas about what their firms were, his economist colleagues were more or less in the dark, focusing on theoretical questions that grew out of nineteenth century marginalist economics and its puzzles over a firm's 'natural' size. To simplify, Coase implied a firm comes into being because it can produce goods and services more cheaply than these goods and services can be acquired in markets (from other existing firms). He did not say much about how the new firm was able to turn this trick; nonetheless he saw firms

required their managers to compare the costs of making against the costs of buying – revealing something essential about the knowledge-nature of firms. The KM implications are clear; the firm is a boundary that contrasts information about the firm against information about its markets.

Coase's work was a huge step forward from both the marginalists' production function ToF and the mechanistic ToF popularized by Max Weber and Scientific Management that paid no attention to what was going on in the firm's markets. Coase was primed from his earlier managerial accounting studies, also known as cost accounting or estimating, and he appreciated its differences from financial accounting. Likewise Coase's intuitions about subordination lie behind principal-agent theory. Here economists look at the costs that arise when a subordinate's interests and knowledge differ from the principal's (manager or owner). Some managers might address the differences by spending money on monitoring subordinates' activity, and workplace surveillance is a rapidly expanding business. Other managers might spend money on performance incentives and there is a huge literature on various pay schemes' strengths and weaknesses. The economic intuition is to seek the situation of greatest economic benefit, balancing the losses occasioned by interest and knowledge differences against the monitoring and incentive costs. Again the KM implications are clear, gather information about losses – such as 'leakage' in supermarkets – against the costs of security cameras, RFID tagging, workplace 'snitches', and so on. This is practical stuff about practical KM systems and much in evidence in real firms – yet typically ignored in the KM literature that provides no 'practice-base' to the author's notion of knowledge. We can surmise firms that find internally generated losses their primary strategic challenge want their KM system designed around that – such as hedge funds who profit from 'insider information' are likewise exposed to such losses. A hedge fund's bureaucratic aspects can probably be taken care of by off the shelf accounting software. Firms that find market cost information strategically crucial – such as high-speed stock traders – likewise know well what kind of KM system they need.

There are other micro economic theories – nexus of contracts, property rights, team production, etc. – but the principle involved is the same; each carries its own KM message, and this needs to be unpacked for a successful KM result (Spender 2013b). The academic intuition, of course, is that if all these theories could be combined, like taking reports from each of the seven blind men (micro economists), a 'total' theory of the firm will arise. As this happens we will develop a 'total' picture of the firm's KM requirements. The practitioners' answer is that this is a typically impractical academic notion, not one that reflects the firm's strategic reality and the managerial judgment required to balance KM effort and return. In practice it probably makes better sense to disaggregate the 'firm-first' KM strategy and focus on those elements that offer the most significant immediate returns. There is strong empirical evidence that KM projects with modest partial objectives are more likely to succeed than broad firm-wide project to transform the business model; these are attractive to technology boosters, yet have a horrendous failure rate.

## 4 Managerial Judgment

The discussion above argues that building a successful KM system starts with understanding the specifics of the firm the system is to support. This is no trifling comment for there is no general KM systems design precisely because there is no universal ToF. While firms may share a great deal, every firm is unique in strategically important aspects and, in consequence, tricky to understand. It has a measure of 'inimitability'. Second, it may not be worth trying to go much beyond the most strategically weighty aspect of firm and its KM implications. Managerial judgment is called for to tame the KM practitioners' technophilia. But the history of KM is not simply of too much technology talk – Prusak's point – rather it shows (a) the futility of trying to define 'knowledge', (b) the positivist tendency to fall back on defining it as computer-manipulated data, but even more importantly (c) the erosion of the 1960s firm-first 'systems analysis' aesthetic. Getting into the indexicalities or specifics of the existing firm surfaces the managerial judgments that shaped that firm's nature as well as its structure, processes, market engagements, and culture. The analysis switches from seeing the firm as an object (defined by a ToF) and towards seeing the firm as an articulation of its managers' subjective judgments. KM's promise to get beyond the limits of management science lies through exploring and presenting management's judgments about the data (facts) of the situation. In this way KM can provide management with strategic support rather being focused on data collection and analysis and tactical support.

The final part of this chapter unpacks managerial judgment and shows the kinds of KM system that might support the managers making judgments. Once again there is nothing new here, yet another example of how much of the history of KM turns out to be of forgetting earlier practical insights in the pursuit of the impractical and dystopian dream of computerizing everything. The promise of 'real time modeling' and 'big data' has led the KM field to forget what we always knew about what computers cannot do for us (Dreyfus 1992). There is an analogy here to the distinction between 'hard' and 'soft' approaches in AI (artificial intelligence). The history of KM shows the dream of 'bringing people back in' of developing a 'soft' approach has persistently failed to stem the technologically-driven advance of 'hard' approaches, even though that takes KM back into IT and abandons its distinctive promise as a discipline about the judgments of those managing firms. KM's inability to deal with knowledge generation and the related concept of profit lurks menacingly in the background. Pre WW2 economists like Coase and Keynes were sympathetic to Frank Knight's 1921 argument that firms that conformed to any fully determined model, such as the mechanical ToF, were incapable of generating profits (Knight 1965). In other words profit-generating firms had to have managerial judgments at their core. Conversely the fully determined mechanistic model is the antithesis of the businessperson's ideal. If profit is the firm's most fundamental purpose then managerial judgment takes both theoretical and practical precedence over analysis. KM's fundamental promise is to translate this realization into appropriate practice and focus on supporting managerial judgment.

Given the dis-aggregation of the firm into several separable aspects, the blind men story, a different kind of managerial judgment is called for to bring the parts together into 'integrated reasoned practice', deciding what to do with the elephant. Implied are two 'dimensions' of managerial judgment and they are 'orthogonal'; one focuses on the effort put into modeling the knowable parts of the firm, the other on synthesizing the results into practice as reasoned as possible. Clearly if the synthesis produces a fully determined model, as a fully optimized bureaucratic model is determining, then the design of the KM system to support this follows directly. But this (a) never happens in real business, and (b) denies the strategic significance and implications of the firm as a profit seeking apparatus. This can be turned around so that the KM system intentionally presents the firm as dis-aggregated, thereby focusing management's attention on the judgments they must make to transition from thinking about the firm's parts and to leading it into acting as a whole.

This sounds more complicated than it is for, once again, this is old stuff made un-fashionable by the technophilic trend to 'hard' concepts – along with using the term 'KMS' to designate a highly computerized KM system. Consider the Balanced Scorecard (BS) and its connection to 'dashboard' or KMS approaches. Academics complain the BS lacks theory and valid metrics and does not lead to an objective performance function i.e. that the BS is not a determining model (Jensen 2002; Voelpel et al. 2006). Yet it remains highly popular with managers, so academics may be misunderstanding the BS's real value. Likewise the history of corporate portals shows the tension between the value of displaying information users find valuable and the difficulty of generating coherent models (Benbya et al. 2004; Dias 2001). The key empirical finding here is that there are two dimensions of use value (a) information quality, such as clarity, validity, and relevance and (b) the way the KMS supports collaboration between the system's users (Urbach et al. 2010). The value of the BS is that it portrays the strategic judgments managers must make as they 'balance' the financial, customer, internal, and learning dimensions of the firm in the discussion that leads managers with diverging interests and knowledge towards a shared conclusion – the firm's strategy. The BS's four dimensions cannot be collapsed into one; the whole point is that the data available to those within the firm are not subsumed under a single objective function. Thus the BS portrays the data relevant to each interest – say finance versus marketing and production – as best it can but then presents the collaborating managers with a question of strategic judgment, to choose the balance to be acted out in the firm's practices. Thus the BS is a management-friendly ToF. Note its history is as a management-driven pushback against the destructive dominance of financial accounting in the firm's strategic conversation, one of the consequences of the decline of managerial accounting (Johnson and Kaplan 1987; Kaplan 2010).

The most mentioned determinant of KM system success is 'top management support', another way of saying top managers' interest in the judgments they have to make. Their focus on strategic judgment needs to be appropriately balanced against the IT designer's enthusiasm for deeper analytics and potential objective functions. The BS is just one of a number of multi-dimensioned non-determining

ToFs circulating today, any one of which can be presented in dashboard KMS format. Favorite is SWOT, though others such as Key Success Factors, the BCG Matrix, and Porter 5-forces are popular (Jarzabkowski et al. 2009). These are best seen as practitioner-driven presentations of the many-dimensional strategic judgments managers must make; they are not, as so many academics think, failed attempts to generate a one-dimensional ToF. They are situated models, to be selected on the basis of their judged strategic relevance. The BS tends to look inward while SWOT looks outwards as well. The BCG matrix is relevant when the strategic challenge involves judging the distribution of funds between the firm's various lines of business. Porter's model is relevant when the strategic challenge is to protect existing rent streams. Each provides the basis for a KM dashboard. Each is a way of operationalizing a firm-first KM project. More importantly, these models show how KM project managers might get into 'rolling their own', developing a business model that truly captures senior management's intentions and intuitions.

### Concluding Comments

The history of KM is as fragmented as the field itself, and given the diversity of our ways of knowing – the basis of the Greeks' KM strategy – KM is not likely to converge into a coherent or one-dimensional positivist 'science'. Indeed the field's pluralism is a virtue that positivistic and scientific approaches lack; it enables talk of value-creation. Clearly most writers and practitioners see KM as a technological field, a sub-field of IT with its emphasis on data. As Prusak suggested, the history here is of the gradual development of corporate IT projects from early accounting and EDP applications into the vast complex real-time enterprise models of today. These developments have been accelerated by recent advances in data collection and analysis now driving 'clouds', 'analytics', and 'big data', especially in travel and retailing, but increasingly important in complex operations such as electricity grid management, financial trading and derivatives, aircraft maintenance, etc. The MOOCs show promise of bringing KM into twenty-first century education. Prusak also noted globalization and, as the global economy and global corporate operations have overtaken domestic operations, the corporation's data collection and communication challenges have scaled up immeasurably, putting pressure on their IT system designers and operations managers. Hackers and others have opened up entirely new dimensions of KM activity and concern, the bailiwick of agencies such as USCYBERCOM and the plethora of corporate computer security units. In short, the KM field's diversity is increasing rapidly.

Many note the term 'knowledge' came into wider use in the 1990s as KM was popularized as tools and techniques for finding and managing the firm's under-managed intangible 'knowledge assets'. The term seemed to offer KM practitioners more scope than 'information' because it suggested different states or kinds of knowing. The explicit-tacit and individual-organizational distinctions became popular and let KM writers reach out from economic notions of corporate asset towards others like culture, skill, and 'best practices'.

Most presumed KM's specific task was to help managements identify the firm's tacit knowledge, bring it to light, gather it up in KM systems, share it, and deliver it to where its value was highest. Such KM seemed to have the potential to bring both tangible and intangible assets into the processes of managing the firm's bundle of assets as rationally as possible, reinforcing the idea of KM as a subset of both IT and accounting. Likewise KM was seen as a set of techniques for improving the utilization and sharing of these assets, a perennial management anxiety about wasting resources on 'reinventing wheels'. One KM variation, contrary to 'knowledge sharing', focused on protecting these newly defined assets through better identification and use of intellectual property rights legislation, patents, copyrights, use agreements, etc. A different slant, influential in the human resource management community, was to categorize intangible assets as modes of 'intellectual capital' – human, structural, and relational, perhaps – widely taken up in the literature though most of the metrics and models that have emerged over the last 20 years are barely practical and lack epistemological foundations. Nonetheless the ideas have impacted political projects to extend corporate accounting for intangibles to the point of provoking regulations about supplementing the firm's balance sheet with 'intellectual capital statements'.

These various projects and advances are best seen as knowledge-oriented applications within the broader class of IT applications now extended to include natural language processing, semantic web management, data mining, knowledge repositories, corporate intranets, and so on. The background assumption is that KM can flesh out a field of rational analysis within which all types of knowledge eventually sum into the firm's 'total' knowledge capital and expose it to rational management. In due course the early enthusiasm around these KM/IT applications waned as they collided with the reality of poor metrics, high KM project failure rate, low user satisfaction, and a deepening appreciation of the limits to technology's impact on the firm's practices and bottom line. Even though some have been arguing for the last couple of decades that the KM party is over the KM industry still offers many jobs, conferences, excitements, and practitioners' journals (Rao 2005).

The history of KM reads very differently for those sensing a distinctive agenda outside IT. Prusak's third notion of the knowledge-centric firm is indicative though he did no more than suggest its history by pointing to the ideas of Arrow, Hayek, Machlup, and Coase. He did not elaborate. Yet these economists, along with philosophers like Ryle and Polanyi, were twentieth century torchbearers of a widespread academic (and political) movement deeply critical of nineteenth century marginalism, equilibrium analysis, and rational man theorizing. These authors' epistemological sophistication, contrasting with their positivistic colleagues' lack, converged with an effort to rethink the notion of profit and answer Coase's questions about the nature of the firm, clarified by Knight's linking profit and value-creation to the managerial judgment required to deal with economic uncertainty. Making something non-tautological and workable out of these ideas requires careful attention to the problems around the term 'knowledge'. As the vast majority of KM authors and the companion



industry of 'KM practitioners' busied themselves with new IT possibilities, a minority of writers struggled with the differences between types of knowledge and the implications for a radically different kind of KM – KM<sup>+</sup> perhaps. The result would be theories of the firm that stand apart – epistemologically – from the mechanistic models presumed by KM authors and system designers of positivist disposition. This group's work continues though the KM mainstream, especially the KM consultants, pays it little attention.

The story of KM's origins, history, and development would be pretty bleak if there was no more to be said. The KM that succeeds is simply IT re-labeled, KM/IT. The contrasting promise of KM<sup>+</sup> as a distinctive academic field engages epistemology's profoundest questions. This chapter suggests a third history – of chances missed and earlier insights abandoned under the cultural and institutional pressure to institutionalize rational choice thinking. We have missed how real world managers have been meeting the wickedest KM challenges all along – for they had to if their firms were to survive. Understanding these challenges begins with admitting bounded rationality, the irrelevance of rational choice thinking to understanding life's practice, especially within real firms. The bad news is that bounded rationality means the KM/IT project can never succeed to the point of making managers' work unnecessary, for firms comprise people as well as knowledge, however this is defined, and people and computers do not share compatible views of the world. Paradoxically the 'hard' KM program is ultimately irrelevant to using KM/IT to best effect. But the good news, which the KM<sup>+</sup> field knows but the KM/IT authors ignore, is that profit itself arises from the uncertainties that bounded rationality generates. The judgment managers then contribute is the font of all profit, yet managerial judgment has lain outside the KM discourse since it arose in the 1990s. While many use the term 'judgment' it is seldom clarified, distinguished from rational decision-making, or its managerial and epistemological implications explored (Foss and Klein 2012; Spender 1989, 2014). Judgment has also largely departed from business education since the 1970s. Prior to that time 'systems analysts' would base their projects on the firm's current practices which, of course, instantiated or indexed management's judgments about how to engage the specific firm's uncertainties. KM's missed chances arose as its new group of authors engaged in the unwinnable battles with epistemology that distracted them away from the 'firm-first' practice of earlier times.

Today KM has the opportunity to re-energize and re-shape its history by drawing in the work of a wide group of authors who already see firms as multi-dimensional complexes of activity, less of epistemology-defined knowledge types but of the firm-defined contrasting practices (Spender 1995). There are many such models in use today as strategy tools and each can be the basis of a KM dashboard (Spender 2014). The result would significantly advance the 'soft' KM program, using its techniques to support management, respecting the value of their judgments, rather than a disrespectful 'hard' program to 'out-model' them with computer-based algorithms.

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# Knowledge Management Concepts and Models

John S. Edwards

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## 1 Introduction

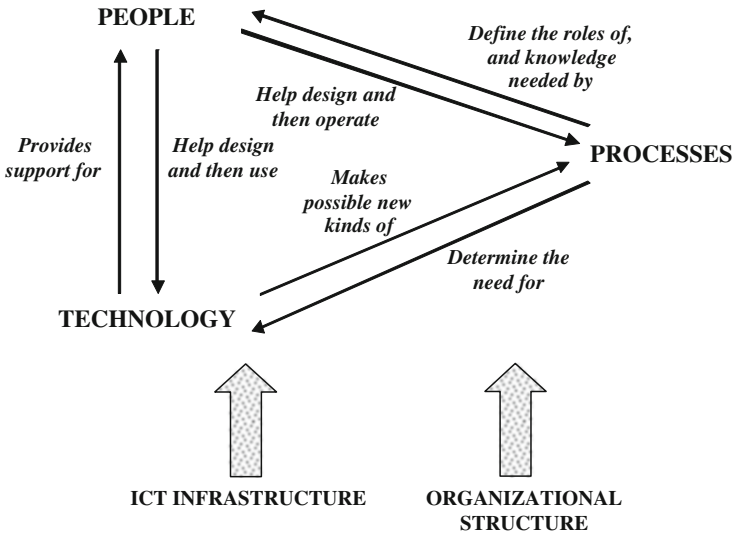
As the previous chapter has explained, knowledge management (KM) has formed from, and been influenced by, several other disciplines. One of the challenges from the earliest days has therefore been to find ways of uniting the disparate theoretical bases of these disciplines, or at least reconciling them sufficiently to be able to build on solid foundations. This has not been easy, and progress has been slow, but KM is in good company on this. Physicists are still edging closer to a Unified Field Theory after 100 years or so, while the countries of the world are split roughly two to one over which side of the road to drive on, and only one country has changed side in the past generation.

The analogy with driving can help us set an attainable goal for KM. There is unlikely ever to be an agreement to all driving on the same side, but it makes sense that everyone drives on the same side throughout one country and that it is well-known that in (say) Japan one drives on the left, while in (say) Canada one drives on the right. So, let us put aside ideas of a single theory of KM, and instead set our sights on the more realistic goal of achieving an agreed terminology or ontology for KM. Indeed, it could be argued that a single KM model might be undesirable, as unless it can be as fundamental as for example the chemists' periodic table, then it might "fossilise" the field and act as a barrier to further progress.

The use of the word "ontology" illustrates the challenge nicely. We have just used it in its information science sense: a taxonomy, classification or categorization of meanings in a field. However, in philosophy, ontology refers to the study of the nature of reality. Taxonomy forms only one small part of that study. So, as information science and philosophy have both influenced KM, we have plenty of

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**Fig. 1** People, processes, technology and structure (Modified from Edwards 2009)

work to do! The most successful ontology (on the information science definition) for KM so far has been the Formal Knowledge Management Ontology (FKMO) of Holsapple and Joshi (2004). The FKMO includes over 100 definitions and axioms relevant to KM, set out in natural language (English). Garbacz et al. (2012) present further work on a KM ontology and review ontologies in related domains.

An examination of the field of KM will rapidly reveal that the road KM drives on also has rather more than two sides to choose between. Heisig (2009) analysed no fewer than 160 KM frameworks, and that number can only have increased since then. There is, for example, no general agreement about the precise meanings of, or relationship between, the terms knowledge sharing and knowledge transfer, even though knowledge sharing is the most-researched topic in KM (see for example Ribière and Walter (2013)). Nor is there agreement over the definition of a knowledge management system (KMS), as we shall see in a later section.

In order to provide some structure to this chapter despite this level of disagreement, we will start from a model originally developed for knowledge management systems. This regards a KMS as comprised of the interaction between three elements – people, process and technology – as shown in Fig. 1. The Figure also shows how these KMSs, whether formal or informal, are further supported by – quite literally, built on top of – the organization: its structure (both “departmental” and the way in which it recruits, supports and develops its human resources) and its technological infrastructure.

Adding the elements of the Figure to the central concept of knowledge itself therefore yields the five aspects of KM that will be covered in this chapter:

- Content aspects
- Process aspects, including knowledge life-cycle models

- People aspects
- Structural and strategic aspects
- Technological aspects

There is no specific order in which these must be considered in any KM initiative. Our order here is chosen as much for ease of linking the sections as any other reason.

Before we move on, we do need to consider one over-arching question, although our approach to answering it may disappoint some readers. That question is: what is knowledge? Once more, there is no generally agreed answer: Mingers (2008), for example, offers 13 different senses of meaning for the phrase “I know”. So, rather than fill this whole book discussing the question, instead we will not work with a single specific definition. As Alavi and Leidner (2001, p. 109) put it, “such an understanding of knowledge was neither a determinant factor in building the knowledge-based theory of the firm nor in triggering researcher and practitioner interest in managing organizational knowledge”. The context of KM in this chapter will be the idea of managing organizational knowledge, though many of the concepts and models also apply to KM at different levels, ranging from individuals through SME clusters to cities and nations, and perhaps even to the whole world. Some shades of the different schools of definition will however need to be covered in the next section.

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## 2 Knowledge Content Aspects

We begin with a reasonable measure of agreement: all knowledge must be “about” something, and at least one human has to have been involved somewhere in the process of creating that knowledge, even if only in deciding to accept the validity of the output from a business intelligence system. But that’s as far as we can get. The most fundamental debate about knowledge content is whether knowledge can exist – or at least be meaningfully discussed – independently of a human knower. The literature presents support for answers of both “yes” and “no” to this question, and for several compromise positions in-between.

A pure “yes” answer leads to consideration of knowledge as an object, and thus KM becomes mainly a question of managing things – managing those objects.

A pure “no” answer means that KM, if that phrase may be used at all in this context, becomes a challenge of people management – managing the knowers.

Naturally the compromise positions mean KM involves managing both knowledge objects and people, and as this is the more general view, it will be the one we assume in the remainder of this chapter.

## 2.1 Tacit and Explicit Knowledge

There are many other distinctions between types of knowledge. The one most frequently seen in the KM field is that of the distinction between tacit knowledge and explicit knowledge. This was originally proposed by Polanyi (1966), and summed up in his memorable phrase “we can know more than we can tell” (p. 4). Interestingly, Polanyi actually refers to tacit *knowing*. “Explicit or codified knowledge refers to knowledge that is transmittable in formal, systematic language. On the other hand, tacit knowledge has a personal quality, which makes it hard to formalize and communicate” (Nonaka 1994, p. 16). The tacit-explicit distinction was popularised in the context of KM by Nonaka and Takeuchi (1995) as part of their SECI model (see later in this section). As such, this distinction is also perhaps one of the most widely misunderstood concepts in KM, as many authors have taken it to mean that any particular “piece of knowledge” can be categorized as either tacit or explicit. However, the majority view accords with Polanyi’s proposal, which was that all “pieces” of knowledge have both tacit and explicit components. Perhaps this is best thought of as a tacit “core” with an explicit layer surrounding it. The relative size of the tacit core will be greater for some pieces of knowledge than others. For example, there is much less tacit knowledge involved in processing an application for life insurance than in riding a bicycle. The latter is entirely tacit except for “sit on the saddle, hold the handlebars and put your feet on the pedals (but not yet!)”. The knowledge involved in building a brick wall would fall somewhere between these two examples. Alternatively, authors such as McInerney (2002) see there being a continuum of knowledge types running from fully tacit at one end to completely explicit at the other.

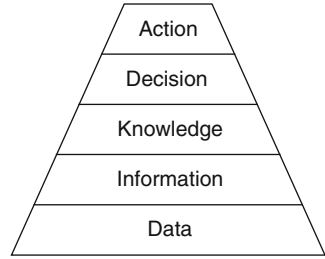
## 2.2 How Does Knowledge Arise?

An alternative way of thinking about knowledge is to consider the process by which it arises. One common approach, originating in computer science, is based on the idea of data leading to information which in turn leads to knowledge. There are several slightly different views of this relationship, but they can be summarised as follows.

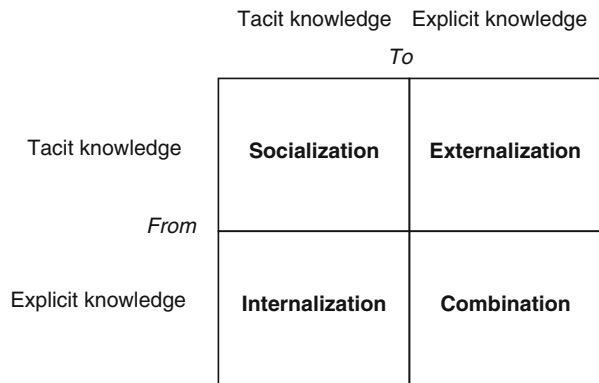
Data consist of unprocessed facts and observations. Data are transformed into information by adding context; selecting and processing the data to be relevant to a specific person or issue (and usually both, since the relevance of the issue is determined by one or more people). Knowledge then consists of more structured information, information with meaning, transferable from one issue to another.

This is often pictured as a pyramid-shaped hierarchy with data at the bottom and knowledge at the top, but several authors have proposed modifications to this. Tuomi (1999) inverts the hierarchy, arguing that even deciding that something is data requires knowledge – again bringing in the central role of the human knower. Checkland and Holwell (1998) propose a similar idea in the form of *capta*, which they define as that sub-set of the vast mass of data to which we choose to pay

**Fig. 2** Wilson’s processing hierarchy (Based on Wilson 1996, p. 34)



**Fig. 3** SECI model – modes of knowledge creation (Based on Nonaka 1994)



attention. Thus capta sit on top of data in the pyramid, information and knowledge being based on the capta. Wilson (1996) takes the hierarchy in a different direction, as shown in Fig. 2, by incorporating the purposes for which the knowledge is to be used – which he would have termed “processed”.

### 2.3 The SECI Model

An alternative view of where knowledge comes from, which is probably the one most commonly cited by those who are not from a computer science background, will also form a convenient bridge into the next section. This view is what is now known as the SECI model (Socialization – Externalization – Combination – Internalization) of knowledge creation (Nonaka and Takeuchi 1995), first proposed as the “knowledge spiral” by Nonaka (1991, 1994). It combines two ideas: conversion of knowledge between tacit and explicit, as shown in Fig. 3, and a spiral progression upwards (or outwards) from the level of the individual to that of the organization. The four modes of creation are defined as follows (Nonaka and Toyama 2003, p. 5):



*Socialization* – sharing and creating tacit knowledge through direct experience;  
*Externalization* – articulating tacit knowledge through dialogue and reflection;  
*Combination* – systemizing and applying explicit knowledge and information;  
*Internalization* – learning and acquiring new tacit knowledge in practice

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### 3 KM Process Aspects

Process can have several meanings in KM. These include the idea of knowledge as a social process; the view of KM itself as a process; the processes that knowledge goes through in an organization (of which the SECI model is one example); and the processes of the organization examined from a knowledge viewpoint, which was their meaning in Fig. 1.

Knowledge as a social process takes the association of knowledge with a human knower further, so that knowledge is seen as belonging not just to a knower but to a community of knowers, who serve to validate it in some sense. Whilst this is one of the less-disputed elements of KM theory, the benefits and limitations of this view are well illustrated in history by Galileo Galilei’s long struggle to convince others that the earth orbits the sun, rather than the sun orbiting the earth.

#### 3.1 KM Maturity Models

From a KM point of view, the most strategic use of the term process concerns an organization-wide view of KM as a process, in the form of KM maturity models. We have proposed one of these models ourselves (Edwards et al. 2005a) as follows:

Stage 0	Unaware of the need for knowledge management
Stage 1	Aware of the need for knowledge management but not actively doing it. Little appreciation of what is involved in actively carrying out knowledge management as distinct from information management
Stage 2	Doing knowledge management but not strategically across the whole organization (at best “islands of knowledge” not “joined up knowledge management”)
Stage 3	Doing knowledge management strategically and reviewing it

Siemens AG devised a knowledge management maturity model (KMMM) based on the CMM (Capability Maturity Model) well-known from software engineering and first published by Paulk et al. (1993). The Siemens KMMM identifies five maturity levels: initial, repeatable, defined, managed and optimizing (Ehms and Langen 2002). Infosys Technologies similarly devised a five-stage knowledge management maturity (KMM) model, with the five stages being default, reactive, aware, convinced, and sharing (Mehta et al. 2007). Other KM maturity models have been proposed, but none has yet achieved the status that the CMM enjoys in software engineering.

## 3.2 Absorptive Capacity

Equally strategic, although it can also be applied to smaller units than the whole organization, is the concept of absorptive capacity, originally proposed by Cohen and Levinthal (1990). This describes the ability of individuals, units or organizations to learn, defined as “the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends” (p. 128). According to Cohen and Levinthal “the ability to evaluate and utilize outside knowledge is largely a function of the level of prior related knowledge” (also p. 128). The most strategic aspect of organization-wide absorptive capacity is the subsequent contention by Grant (1996), as part of his knowledge-based theory of the firm, that profits are created primarily through realised absorptive capacity. Grant’s work remains perhaps the strongest foundation for the strategic importance of KM.

## 3.3 Activities and Processes in KM

Turning our attention to the activities and processes that are involved in KM brings us face-to-face with the full scope of the 160 frameworks mentioned earlier. The majority of them – 117 according to the analysis by Heisig (2009) – include some kind of list of activities or processes. Some lists have been produced by concentrating on the knowledge and what is happening to it, others by concentrating on what someone is doing with it, and still others explicitly on knowledge *management*. Naturally these three overlap, sometimes even within the same list.

Starting from the knowledge perspective, we offer the view of Wiig, the person who gave KM its name. Wiig (1993) identifies four sets of activities, each focussed on the knowledge itself:

- Creation and sourcing
- Compilation and transformation
- Dissemination
- Application and value realization

By contrast, Alavi and Leidner (2001, p. 115) approach more from the “what someone is doing” viewpoint, and propose what they describe as ‘four sets of socially enacted “knowledge processes”’:

- Creation/construction
- Storage/retrieval
- Transfer
- Application

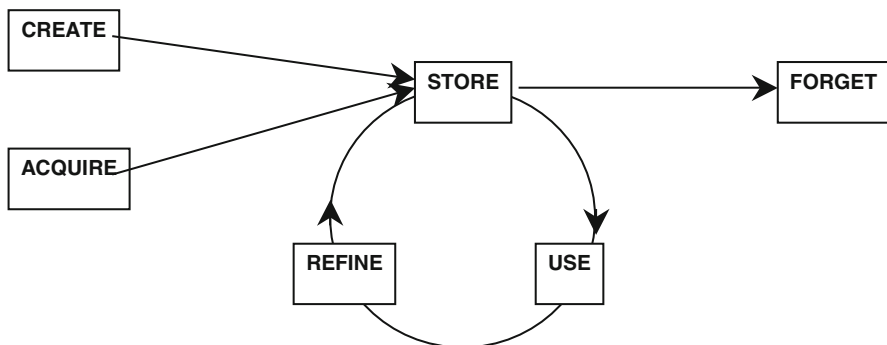
For our third list, we offer that of van der Spek and Spijkervet (1995) as one which appears to focus more specifically on *managing* the knowledge. Their list runs:

- Creating knowledge
- Securing knowledge
- Distributing knowledge
- Retrieving knowledge

There are many other descriptions of the knowledge management process, from viewpoints similar to those above or different again. A summary of several of the earlier ones may be found in Beckman (1999). More recently, Heisig grouped all the activities in the 117 frameworks he analysed into the six most common categories (Heisig 2009, p. 9). These are:

- Share knowledge
- Create knowledge
- Use knowledge
- Store knowledge
- Identify knowledge
- Acquire knowledge

Note that these are in descending order of the number of times they appeared in other frameworks, not in any chronological sequence. When the processes are presented in chronological order, it is referred to as a knowledge “life cycle”. There are, inevitably, many of these, too. Naturally we prefer to present our own, as shown in Fig. 4. This is not simply bias, but because the model in Fig. 4 does not include knowledge sharing/transfer as an activity in itself. We believe this difference in focus is important, since we do not regard knowledge sharing, at least in an organizational context, as an end in itself, but as a means to some wider purpose. That purpose must be addressed in two stages: first, the business process or



**Fig. 4** Knowledge life cycle (Modified from Edwards 2001)

processes to which the knowledge is relevant; and only then the knowledge-related activity.

Earlier we mentioned confusion over the use of the terms knowledge sharing and knowledge transfer. On the one hand, many authors use the terms knowledge sharing and knowledge transfer interchangeably (Klein 2008). However, on the other hand, there is a widely-accepted school of thought that distinguishes between the two along the lines of the definition from King (2006):

transfer implies focus, a clear objective, and unidirectionality, while knowledge may be shared in unintended ways multiple-directionally without a specific objective. (p. 493)

Berends (2005), for example, observes that “knowledge sharing and knowledge transfer cannot be treated as equals. Knowledge sharing encompasses more than only the transfer of descriptions containing justified factual information. . . .many knowledge sharing episodes contribute to the creation of knowledge, by formulating a problem, suggesting a potential solution, contributing to the justification of solutions or stimulating someone to reflect on something” (p. 104).

Just to confuse matters further, Szulanski (2000), one of our key sources for the next section of this chapter, used the term knowledge transfer, but he clearly means the wider process we are calling knowledge sharing:

Knowledge transfer is seen as a process in which an organization recreates and maintains a complex, causally ambiguous set of routines in a new setting. (p. 10)

Others also use knowledge transfer for the wider activity, such as Levine and Prietula (2012), who refer to the “transfer (or exchange) of knowledge” but from their discussion evidently are addressing what we call knowledge sharing, and indeed Alavi and Leidner (2001) in their list of knowledge processes mentioned above.

As if this were not sufficient confusion, new versions of KM process models continue to appear. For example, Jimenez-Jimenez and Sanz-Valle (2013) present a model of the KM process comprising knowledge acquisition, distribution, interpretation and memory, which they attribute to Huber (1991). Now, Huber was working before the term KM had come into widespread use, so it is not surprising that at the time he actually described these activities as relating to organizational learning, not KM. However, Jimenez-Jimenez and Sanz-Valle (2013) have made significant changes to the names of the constructs: originally they were knowledge acquisition, information distribution, information interpretation, and organizational memory. Changing “information” to “knowledge” is a non-trivial difference!

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## 4 KM People Aspects

Mention of organizational learning forms a natural link into the “KM people” section, since there are still a small minority – from a pure “knower” viewpoint – who would say that only individuals can learn, not organizations. We will assume in the rest of this chapter that organizations can learn, but also that the process is a complex one.

## 4.1 Communities of Practice

A common theme amongst most of the “people” aspects of KM is the relevance of the networks to which people belong, whether formal or informal, whether entirely within the organization or partly outside it. The key people-related concept for KM is that of the Community of Practice (CoP) identified by Lave and Wenger (1991) and Brown and Duguid (1991), and investigated in more detail by Wenger (1998) and many others since – see for example Coakes and Clarke (2006). The concept of the CoP arose from consideration of learning through practice, extending the idea of the apprenticeship. The early work on CoPs tended to go for longer characterizations rather than short “definitions”, but Wenger and Snyder (2000) offer the following (p. 139) “groups of people informally bound together by shared expertise and passion for a joint enterprise”. The principal difference from an apprenticeship model is that while a CoP has fully participating members, it does not have the role of master that the apprenticeship model does. Thus, even when formal, the CoP is more fluid. This means that whilst CoPs may be nurtured or assisted by the formal organization, they cannot be mandated, because *passion* cannot be mandated. Even in a formal group, the informal binding is a crucial element.

The theory around CoPs is extremely useful for explaining how newcomers to a craft or profession gain expertise, but less effective at explaining how the experts continue to learn, or how knowledge arises from interactions of groups of people with different expertise. A very important contribution to the latter, and especially to radical advances in knowledge creation, is that we learn more from our weak ties (Granovetter 1973). This is because people in our networks with whom we have stronger ties tend to think in more similar ways to ourselves, and the “creative spark” is less likely to occur there than in a more diverse group. There has to be some sharing, however – a group with ties so weak or expertise so diverse that they cannot understand each other is unlikely to survive, let alone deliver results. This is supported by research on team formation, which similarly finds that teams with medium variation/diversity are the most effective (Brodbeck et al. 2011).

## 4.2 Sticky Knowledge

A concept related to that of absorptive capacity, but specifically bringing in the individuals involved, is that of sticky knowledge, identified by Szulanski (1996). Szulanski researched the transfer of knowledge, specifically best practices, within an organization, and defined stickiness very simply as the “difficulty of transferring knowledge within the organization” (Szulanski 1996, p. 29). This was partly derived from von Hippel’s (1994) concept of sticky information, although that specifically concentrated on the cost of transferring the information. In two studies (Szulanski 1996, 2000), Szulanski tested the effect of various attributes of the practices/knowledge, source, recipient and context on knowledge stickiness, and concluded that the two most significant predictors were “Causal Ambiguity” (essentially the extent to which the knowledge is tacit) and “Recipient lacks

Absorptive Capacity” (as discussed earlier). Note that, as we have seen, the original concept of the latter was for the firm rather than an individual.

### 4.3 Narrative/Story-Telling

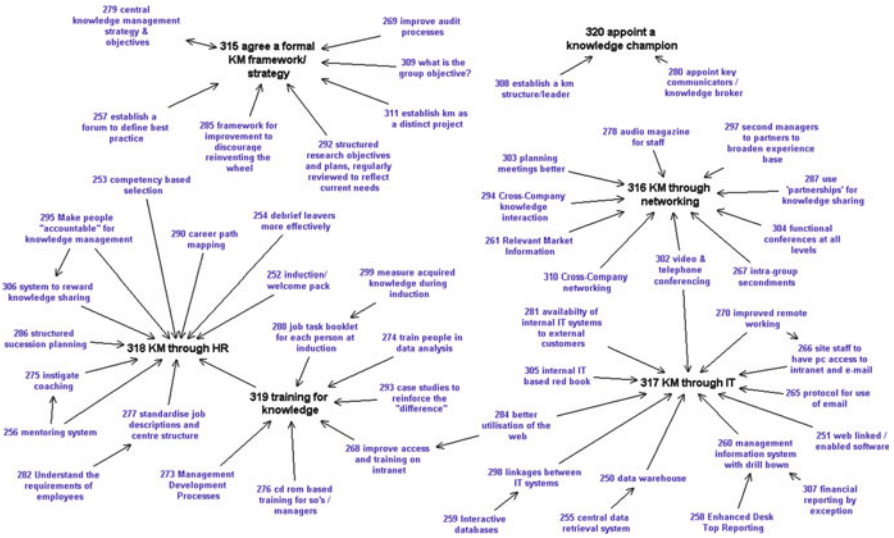
Another important people aspect, albeit one that can hardly be claimed as unique to KM since its roots lie back in pre-history, is the relevance of narrative or story-telling as a way of sharing knowledge. The study of Xerox photocopier technicians by Orr (1996) is generally seen as an early seminal example of the use of story-telling for KM, and the further analysis by Cox (2007) shows how Orr’s narrative subsequently took on a life – and a narrative – of its own within the literature. Narrative remains a very active field of KM-related research, especially as a potential bridge between individual and organizational learning. For example, Kwong and Lee (2009) describe how narratives were used to elicit knowledge from engineers about reliability management in an airline, while Garud et al. (2011) examine how narratives enable learning from unusual experiences. Gorry and Westbrook (2012) demonstrate how the narratives need not come from within the organization at all – customers may well have stories of value to the organization, but often these are at best able to be shared with other customers, not members of the organization itself. Burnett et al. (2013) take the idea further still, examining the deliberate construction of organizational “learning narratives”. By its nature most published articles on this topic are reports of single case studies, which can make it more difficult to learn implementable lessons from them.

### 4.4 Cognitive Maps

A visual representation of “pieces of knowledge” and their connections can encourage people to understand and discuss them in a more structured way than narratives. Cognitive maps are designed to show links between concepts, and can be used either with individuals or with groups, or indeed first at the individual level and then combined to give group maps. Kwong and Lee (2009), as cited in the previous section, use cognitive maps to represent the knowledge elicited from the engineers. We have used them extensively ourselves to investigate KM and especially KM strategy in organizations (Edwards et al. 2005b; Shaw and Edwards 2005, 2006; Shaw et al. 2006). Figure 5 is an example of a cognitive map from one of our studies.

### 4.5 Social Network Analysis

The last important concept in this section is that of social network analysis. Again this pre-dates KM, this time by many decades, from its roots in anthropological research. As with cognitive maps, it is a mapping-based technique, with the



**Fig. 5** A cognitive map relating to KM strategy (From Edwards et al. 2005b)

elements this time being individuals, groups or even organizations. Social network analysis covers the study of who connects to whom, and several techniques for the analysis of social network structures in terms of concepts such as the position and density of nodes have been developed. The analysis may also include more qualitative aspects such as an assessment of the strength of ties. The nodes used in the analysis may be at the level of individuals, groups or companies. Examples of the use of social network analysis in the KM field include those of Alavi and Kane (2008), Smith and McKen (2007), Liebowitz (2005). Mention of structures takes us nicely into the next section.

**5 KM Structural and Strategic Aspects**

Two significant dichotomies are at the heart of much of the work in KM related to KM strategy and consequently KM structure. One concerns the intention of managing the knowledge (“what are we doing with the knowledge?”), the other the approach taken – the KM strategy itself (“how do we make it happen?”).

**5.1 Exploration Versus Exploitation**

The principal choice regarding what to do with the knowledge is between exploration and exploitation: “the exploration of new possibilities and the exploitation of old certainties” (March 1991, p. 71). In other words, what should the balance of effort be between creating/acquiring new knowledge and using the knowledge that

the organization already has? This balancing between the future and the present is a central element of any business strategy and one that many organizations get wrong.

Linking back to the previous section, a social network analysis at the organization level by Gilsing et al. (2008) suggested that network density of a firm actually has an inverse U-shaped relation with exploration activities of the organization. At first, as the number of connections increases, exploration becomes more successful. However, once a certain threshold is reached, success tails off: a very dense network may lead to undesired spillovers, redundant knowledge and excessive loyalty to current partners.

## 5.2 KM Strategy: Personalization and Codification

Almost independent of the exploration/exploitation choice is that of the KM strategy to achieve the exploring and/or exploiting. The essential work on KM strategies is by Hansen et al. (1999), which identified the two fundamental KM strategies as codification and personalization. The personalization strategy takes the “knower” viewpoint that the organization’s knowledge resides mainly in the heads of its people (and thus is tacit), and the main purpose of KM systems is to help people locate and communicate with each other. The codification strategy takes the viewpoint that the most relevant knowledge for the organization can be made explicit, codified and stored in computer format, so that it may be widely shared. Even though this was mainly based on an analysis of just one industry sector – management consulting – plus just one pair of examples from each of two other sectors, most subsequent work on KM strategy takes this dichotomy as a foundation.

More arguable was the further suggestion by Hansen et al. (1999) that organizations should concentrate on one of the two strategies with at least an 80–20 split, however one might measure 80 % of a strategy. Many have challenged this, with one of the most recent even drawing on data from the same management consulting sector (Powell and Ambrosini 2012).

## 5.3 Alignment with Business Strategy

One aspect of KM strategy on which there is general agreement is that KM strategy needs to be aligned with business strategy, and we are not going to argue with that. However, it is intriguing to observe that the Hansen et al. (1999) paper does not specifically refer to any of the literature on business strategy at all. Not that there is any single agreed view in that literature either! Hansen et al. identify the two competitive business strategies of standardization and customization as fitting with codification and personalization KM strategies respectively, and thus it is clear that they take a market-driven view of business strategy. Nevertheless, these two business strategies do not exactly match the best-known exposition of market-



driven business strategy, that of Porter (1980). The market-driven view of strategy asserts that the main drivers for strategic choice are external to the organization. One of the main alternative views of business strategy is the resource-based view (RBV), which believes the main drivers for strategic choice are internal ones, such as an organization's core competences. The resource-based view was proposed by Grant (1991) and developed into the knowledge-based theory which we have already mentioned. It is not unusual in the KM literature to find articles on KM strategy which claim to build on both Porter's and Grant's work without realising that their theoretical bases are not compatible; for obvious reasons we will not cite any of them here.

Whichever KM strategy is adopted, an important element of monitoring that strategy is to be able to measure its effectiveness. Accountants and others have been grappling with the issue of trying to measure knowledge, or the effectiveness of its management, for the past 20 years. A pioneer in this field was Sveiby (1997). His work and that of others (Edvinsson and Sullivan 1996; Roos and Von Krogh 1996) has led to the field now known as intellectual capital research. Not surprisingly this has progressed better in relation to the view of knowledge as an object and strategies of codification, which can lend themselves to quantification, than in relation to attempts to "measure" the knowledge in people's heads, which at best need to be qualitative. A good summary of the current state of knowledge measurement may be found in Bolisani and Oltramari (2012).

## 5.4 Somewhere to Share Knowledge

Turning to a more abstract aspect of KM structure, which is definitely not easy to measure, we find the concept of *ba* – originally proposed by Nonaka and Konno (1998). *Ba* is a Japanese word meaning something approximating "place" or "space", which it has been claimed has no direct equivalent in English. Snowden (2000) sees similarities between *ba* and the Welsh word *cynefin*, although he states that the latter has a historical dimension that the former does not. *Cynefin* also is claimed to have no English equivalent, although to this chapter's author, as a Londoner, both seem to be very close to the London slang term "manor". In KM, *ba* is where knowledge may be created or shared. Although different types of *ba* have been identified, some physical and some virtual, we have found that the concept of *ba* as "a way of organizing...rather than a form of organization" (Nonaka and Toyama 2003, p. 7) is the most useful way to think of it.

Finally, to link this section to the next, we return to types of KM strategy. Earl (2001) extended the codification/personalization dichotomy to identify seven different strategies, or "schools", for KM, concentrating on the nature of the IT support required. He named them as: systems, cartographic, engineering/process (these three being the "technocratic" schools), commercial (the "economic" school), organizational, spatial, and strategic (these three being the "behavioural" schools).

## 6 KM Technological Aspects

Here we mention two aspects: the use of technology to support KM in general (knowledge management systems), and one of the most useful applications in helping to structure and process knowledge (ontologies).

### 6.1 Knowledge Management Systems

As we hinted in the Introduction to this chapter, although it may come as a surprise to some, there is even a fundamental difference in definitions in the apparently clear-cut world of technology, namely – what is a KMS? There are two common answers to this question, which we shall term as “narrow” and “wide” views. The narrow view is concerned solely with the technological artefacts: for example, Alavi and Leidner (2001) define a KMS as “a class of information systems applied to managing organizational knowledge” (p. 114). The wide view is the one that we have already implied in Fig. 1 – that technology is only one part of a KMS, along with people and systems or processes, and indeed that a KMS would not necessarily have to use information technology at all. We have described one example of a shopfloor KMS in manufacturing (Edwards 2009) where the only IT used was word processing software to produce laminated sheets of “best practice” instructions.

It will be clear that the wide view of KMS can incorporate the elements and issues of the narrow view within it, but not the other way round. Thus a concentration on the narrow view can lead not just to consideration of knowledge as an object, but to considering only the object, and not what anyone does with it. This has long been a well-known recipe for KMS failure (see, for one of many examples, McDermott (1999)) but organizations continue to make this mistake even now, as recent conversations with this chapter’s author at an industry conference confirmed. The relationship between the technology and its effective use is a subtle one. The realization that untargeted “push” systems (where everything is made available to everyone and people have to filter it to find what they need) are not effective even for information management, never mind KM, came several years ago (Damodaran and Olphert 2000). However, the knowledge-based systems field, one often neglected by those in the KM field (Edwards 2003; Hendriks and Vriens 1999; Liebowitz 1998), provides the complementary finding that 100 % “pull” systems (providing only what is specifically demanded) do not work either, because those who most need help in a particular situation may be the least likely to seek it (Edwards et al. 2000).

### 6.2 Ontologies

Ontologies (with the information science meaning of the term) are the result of addressing the meaning of terminology in KM from the “knowledge as an object” viewpoint. Gruber (1995) defines an (applied) ontology as a formal specification of

shared conceptualisation. An ontology thus comprises more formalized and structured relationships between concepts than those seen in cognitive maps, thus enforcing greater rigour and permitting much more by way of automated processing of these knowledge objects. The kind of disagreement on the meaning of fundamental terms that we have already discussed arguably makes ontologies potentially even more useful in KM, since automated processing is an effective way to highlight inconsistencies and gaps. Thus the construction of an ontology can be a central element in understanding the codified knowledge in a domain. Ontologies may be constructed by working with domain experts (Rao et al. 2009; Almeida and Barbosa 2009), or increasingly by automated means (Guo et al. 2009). Gavrilova et al. (2013) give a comprehensive review of how to develop ontologies.

As mentioned earlier, the FKMO (Holsapple and Joshi 2004) is the best-known ontology for KM itself. However, Garbacz et al. (2012) point out an obstacle here: KM ontologies often refer to fundamental concepts (“primitives”) from outside KM which are not well-defined either, such as the meaning of “an organization”.

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## Conclusion

In this chapter, we have looked at what we believe to be the most important KM concepts and models. Inevitably this can only be a small subset of all those that have been produced.

The fundamental split in the field that was identified more than a decade ago as the difference between what many called first and second generation KM is still visible. Swan et al. (1999) label the distinction as between cognitive and community perspectives; Cook and Brown (1999) as between an epistemology of possession and an epistemology of practice. First generation KM was seen as emphasizing knowledge as an object, codification approaches and support for KM that was heavily based on IT. Second generation KM by contrast stressed the importance of the role of the knower, personalization approaches and supporting contact between people.

Rather than pursue a pointless quest for third generation KM, the most useful research over the past decade has taken the best from both of the earlier generations, and added to it. As we have seen in this chapter, KM is not solely about technology, or solely about people: in fact it has five interlocking aspects, covering content, process, people, structure and strategy, and technology.

The main challenge for KM researchers is therefore to develop models that incorporate enough of this complexity to be effective, while remaining simple enough that people who are not KM experts can use them. The nature of KM in practice means that this use has to be conceived in terms of support for a process of “doing KM” rather than as some kind of “solution to KM problems”. Many of the necessary elements in the form of specific models and technological support are already present, as outlined above. Perhaps what is most needed is a better way of including the dynamic and ongoing nature of KM in organizations, as a continuing activity where the options depend on the path that KM in that organization has already followed.

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# A Descriptive Analysis of Knowledge Management Research: Period from 1997 to 2012

Meliha Handzic

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## 1 Introduction

Knowledge Management (KM) is a relatively young field of study, just about 20 or so years in the making. So far, the examination of the field of KM has revealed two things: (a) the origins and development of KM have been influenced by many different disciplines; and (ii) there is no general agreement about the precise meaning and relevance of KM (Swan et al. 1999; Venters 2006). Furthermore, there is no clear differentiation between KM and the fields of Organisational Learning (OL) and Intellectual Capital (IC). The position taken here is that OL and IC address KM partially, by focusing solely on the organisational level and economic perspective of KM, respectively.

Such an unclear picture, multidisciplinary ownership (e.g. management, information technology, human resources, library science, economics etc.) and doubts of being just another “fad” (Baruch 2000) or “ephemeral management fashion” (Hislop 2010) all warrant the continued examination of the field of KM. Therefore, the current chapter follows and builds upon previously reported analyses in chapters “Knowledge Management: Origins, History, and Development” and “Knowledge Management Concepts and Models” of this book by focusing on KM research published in KM journals.

The current chapter is primarily motivated by a concern for the direction and maturity of KM research. Given that KM is such a young field of study, it is especially felt that there is a need to address the following two concerns: which concepts and issues are being addressed by KM research (ontological concerns) and which approaches are being used in KM research (epistemological concerns). An additional third concern addressed in this chapter is a portrait of KM research

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community and its members. It is recognised that researchers necessarily bring subjectivity to their field of study. This subjectivity may come from the personal interest of an individual researcher or those around him or her. Adopted research approaches and focus of KM research can be seen as an expression of a personal or community filter associated with a set of values of what is important, good, true etc.

Therefore, to explore these three concerns, the current project is initiated based on the analysis of research papers published in key KM journals since their beginnings in 1997.

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## 2 Relevant Prior Research and Current Objectives

Journals play an important role in the recognition and development of any academic field. Given that the field of KM is relatively young, there are not many well-established specialised journals that currently exist to support the recognition of KM as a distinct and reputable scientific field. Therefore, this study of key KM journals has been undertaken with the purpose of mapping significant knowledge management research to date. This is carried out by analysing the prevailing research approaches, focus and authors of articles published in top four specialised academic journals in KM over the past 15 years.

A recent ranking study (Serenko and Bontis 2013b) identified and evaluated 25 different academic journals that address various aspects of knowledge management research and/or practice, systems and culture, intellectual or intangible capital, learning, organisation and society, development, change and transformation. The ranking study concluded that the major factors affecting the quality of evaluated journals were the importance of published research (inclusion in citation indexes, citation impacts and ranking lists) and people involved (leading researchers, the review board reputation and the editor). The list of top 5 KM/IC journals from the expert survey includes: *Journal of Knowledge Management (JKM)*, *Knowledge Management Research and Practice (KMRP)*, *International Journal of Knowledge Management (IJKM)*, *Journal of Intellectual Capital (JIC)* and *Journal of Information and Knowledge Management (JIKM)*.

A couple of other researchers have recently published reviews of KM research based on published works. Among these are: “Surveying the field of KM: evidence from KMRP” (Handzic 2012), “Ten years of KM research and practice” (Ribiere and Walter 2013), “A tenth anniversary assessment of Davenport and Prusak” (1998/2000) *Working Knowledge* (Oliver 2013) and “Mapping Research Community and Interests in KM: A Case of JKM” (Handzic and Durmic 2013). Common to these reviews is their focus on individual authors and journals.

Among other recent reviews are two interesting analyses of research methodologies (Wallace et al. 2011) and research paradigms (Ma and Yu 2010) of contemporary knowledge management studies. Worth mentioning are also several reviews that address research themes (Lee and Chen 2012) and trends (Dwivedi et al. 2011) in knowledge management, as well as those looking at its identity (Serenko 2013), core and impact (Serenko and Bontis 2013a).

This paper is an extension of earlier work and reports the results of a study based on four top- ranked KM journals. JIC is excluded from the study because of its narrower IC focus. Due to their established positions as leading publication outlets for KM researchers, these four journals may exert a great influence on both the research and practice of KM.

Therefore, the purpose of this study is to identify influential trends and people in KM research in the period from 1997 to 2012. It is hoped that the study of influential KM research in the past may help plan its future course. The general research questions that guide this study are: (i) What research approaches are used in KM research? (ii) What is the focus of KM research? and (iii) What are the characteristics of the KM research community?

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### 3 Methodology

To answer the research questions of interest, this project involves a descriptive analysis of relevant published research. Prior studies have shown that this style of research makes it possible to track the evolution of science by looking at keywords (Handzic 2012), word clusters (Ribiere and Walter 2013) or citations (Serenko and Bontis 2009, 2013a, b) associated with published papers. Therefore, it was adopted as an appropriate method to analyse the nature of KM research published over the past 15 years.

#### 3.1 The Article Sample

The sample of articles analysed in this study is KM research published between 1997 and 2012 in the following four KM journals: *Journal of Knowledge Management (JKM)*, *Journal of Information and Knowledge Management (JIKM)*, *Knowledge Management Research and Practice (KMRP)* and *International Journal of Knowledge Management (IJKM)*.

Previous meta-analyses of KM research focused on either a specific journal (Handzic 2012; Handzic and Durmic 2013; Ribiere and Walter 2013) or used a sampling approach aimed for a comprehensive sample of published work in the area (Serenko and Bontis 2009, 2013a, b). The main concerns regarding these approaches include: not being representative enough of KM (for the first one) and overrepresentation of other fields (e.g. IC, OL) and partial KM aspects (e.g. systems, practice) that can bias the findings. In response to the above concerns, this study adopted a small set of most influential comprehensive journals in KM, based on the belief that such a sample will best represent the field.

Common to all journals in a sample is their aim for high quality papers, scope addressing all aspects of managing knowledge, availability in print and electronic forms, international editorial boards and peer review. Other relevant information specific to each journal is provided in Table 1.

**Table 1** Sample of KM articles by journals

	JKM	JIKM	KMRP <sup>a</sup>	IJKM
Year launched	1997	2002	2003	2005
Published by	Emerald	World Scientific	Palgrave Macmillan	IGI Global
Official publication of	–	iKMS	OR	IRMA
Abstracted/indexed in	SSCI, scopus +9 other	Scopus +3 other	SSCI, scopus +5 other	Scopus +22 other
Rank (expert survey) <sup>b</sup>	1	5	2	3
Rank (citation impact) <sup>b</sup>	1	9	5	10
Tier <sup>b</sup>	A+	B	A	A
Impact factor for 2012	1.474	–	1.069	–
Volumes	16	11	10	8
Issues	82	42	37	32
Sample articles	793	309	253	163

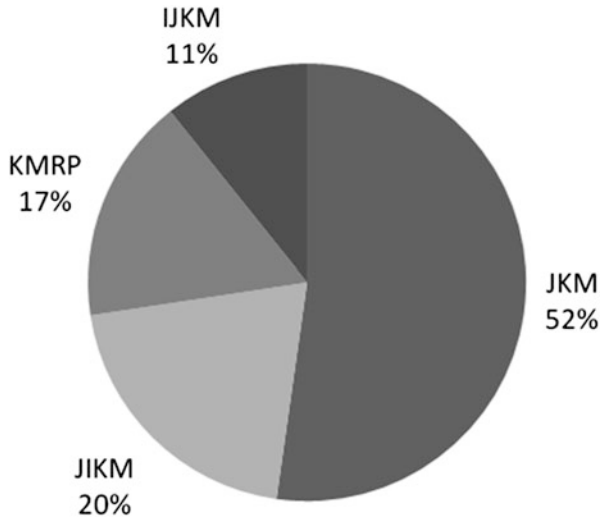
<sup>a</sup>First KM journal to obtain impact factor

<sup>b</sup>Serenko and Bontis (2013b)

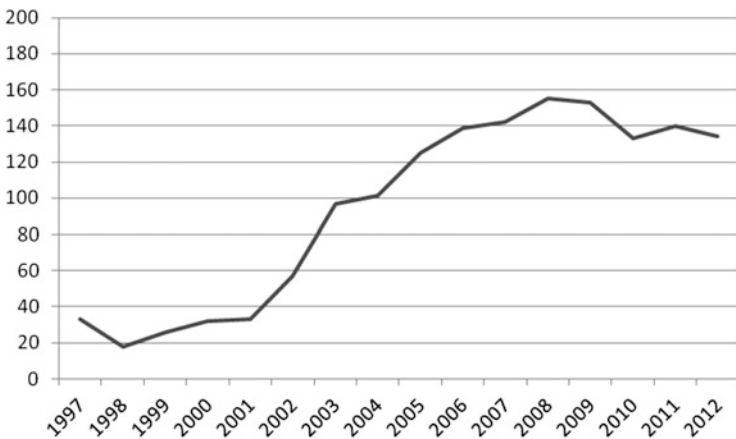
Sample articles were selected manually by six research assistants who examined tables of contents of each issue of each journal. Only research papers were included in the analysis (editorials, position papers, book reviews etc. were excluded). The distribution of articles shown in Fig. 1 indicates that JKM dominates the sample with 52 % of articles.

The time period under investigation is 1997–2012. The starting period is marked by the publication of the first specialised journal in KM (JKM). This period is also an interesting period in the development of the KM field, as is witnessed by a significant growth of research publication outlets and articles. Three new journals were started in response to the growing interest in KM. They are: JIKM in 2002, followed by KMRP in 2003, and IJKM in 2005. The distribution of articles over time shown in Fig. 2 reveals that KM publications reached the peak of 155 in 2008, and have fallen by 14 % to 134 at the end of 2012.

A quick page count of journal issues was performed to check if this trend is real, or simply a consequence of papers getting longer. For some academic journals (e.g. KMRP), it is the number of pages rather than number of papers that govern how much goes into an issue. The page count performed revealed that all sample journals have increased slightly (rather than decreased) their total number of pages per volume since 2008. This indicates that articles became longer and possibly more sophisticated over time.



**Fig. 1** Sample of articles by journal



**Fig. 2** Sample of articles by year of publication

### 3.2 Procedure

A variety of methods have been used so far as a tool for scientific evaluation and strategy in a KM domain. Popular methods include bibliometric analysis (Gu 2004), citation impact (Serenko and Bontis 2004, 2009, 2013a, b) and scientometric analysis (Serenko et al. 2010). Furthermore, subjective expert opinions (Edwards et al. 2003) and visual representations (Epler and Burkhard 2007) have also been applied to the analysis of a KM domain.

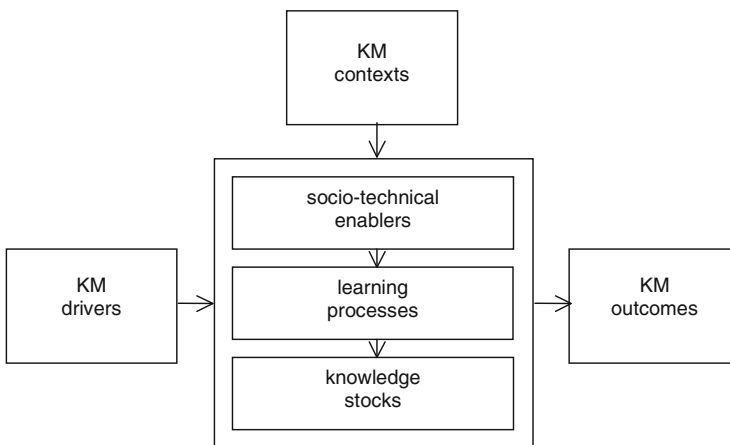
This study applied a combination of quantitative and qualitative content analysis of research articles published in JKM, KMRP, JIKM and IJKM in the period of 1997–2012. The process took place in three steps.

In the first step, data were extracted from each article: year, volume, issue, article number, article type, title, authors, countries, keywords. A total of 1,518 sample articles from 193 issues in 45 volumes were sourced from 4 journals. As mentioned before, only research papers were included.

In the second step, article authors and their regional affiliations were classified, counted and presented graphically. The division into three world regions was based on the Association for Information Systems (AIS) classification (<http://start.aisnet.org/?AISRegions>). Region 1, 2 and 3 represented Americas, Euro-Africa and Asia-Pacific, respectively.

In the third step, all extracted keywords were coded and counted according to the frequency of their mention. The Handzic et al. (2008) integrated knowledge management framework presented in Fig. 3 was used as a theoretical basis for keyword coding and classification.

This framework identifies six major interrelated components of knowledge management: contexts, drivers, enablers, processes, stocks and outcomes. Three of these (enablers, processes, stocks) are core (knowledge-orientated) elements and the other three (contexts, drivers, outcomes) extended (business-orientated) elements of an integrated KM framework. Prior work on consolidation and harmonisation of KM concepts (Heisig 2009) was helpful in the process of classifying similar terms into appropriate core categories.



*adapted from Handzic et al. 2008*

**Fig. 3** Knowledge management framework

Similar to Heisig, knowledge stocks were analysed in terms of dichotomies (e.g. explicit-tacit) or from a strategic perspective (e.g. asset, resource). Words describing various KM activities were grouped into four (compared to Heisig's six) main learning or knowledge processes: (i) create new knowledge (generate, produce, build, acquire etc.); (ii) share existing knowledge (transfer, exchange, communicate, socialise etc.); (iii) retain existing knowledge (capture, codify, store, preserve, etc.); and (iv) discover new knowledge (data mine, identify, classify, analyse, etc.). Heisig's four types of critical success factors were grouped into two classes of enablers: (i) social, including human-orientated culture, people, leadership, as well as organisation-orientated structures, procedures, measurement; and (ii) technical, including technology infrastructure and applications.

With respect to the extended KM model elements (contexts, drivers and outcomes), the study relied on the categorisation guidelines provided by Handzic and Zhou (2005). For example, typical (i) contexts for KM were grouped according to environments (e.g. organisation, city), tasks (e.g. project management, decision making) and doers (e.g. employee, manager, team); (ii) drivers were categorised into knowledge economy, work and worker related motives; and (iii) outcomes were classified as advancement (through innovation) or survival (through improving performance efficiency and effectiveness).

Two additional categories considered in this study were: referent disciplinary/theoretical approaches and research methods. In their *Encyclopedia of Knowledge Management* Schwartz and Te'eni (2011) present two distinct perspectives on KM research: (i) "foundationalist" (or positivist) perspective that seeks to arrive at objective knowledge of social phenomena through the application of scientific methodologies; and (ii) constructivist "antifoundationalist" (or interpretivist) perspective that considers socially constructed knowledge as being "situated" and "distributed", and recognises its role in shaping social actions within communities of practice. As the previous chapters have explained, KM has been influenced by research communities coming from many different disciplines. Identifying and reconciling their differences represented a major challenge.

All keywords extracted from sample articles were analysed. They were coded and counted according to six KM factors (contexts, drivers, enablers, processes, stocks, outcomes) and two research factors (theoretical approaches, research methods). The most frequently mentioned keywords are listed in the results tables.

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## 4 Results

The results of the analyses performed are presented in the following way. Firstly, the analysis of approaches used in KM research is presented by two research factors: underlying disciplines/theories and research methods. This is followed by the analysis of KM focus in terms of six major KM elements (number of keywords per KM element). Finally, the characteristics of the KM research community are analysed in terms of authors' regional affiliation (number of articles per region),

collaboration (number of authors per article) and productivity (number of articles per author).

#### 4.1 Analysis by Research Factors

In answering the first research question (which approaches are used in KM research?) two research factors were considered in this paper: referent discipline/theory and research method.

In order to find out which referent disciplines/theories underlie KM research, keywords from each article were examined to see if any of these were explicitly mentioned in the list. Table 2 shows the results by individual journals and for the total sample.

As expected, the majority of articles in the sample (77 %) cited some disciplinary/theoretical basis for their study. Out of those mentioned, KM was by far the most popular with a score of 802 or 53 %. With respect to 23 % of missing terms, they could have been related to KM, but were excluded as redundant. Among other disciplinary/theoretical approaches mentioned more than ten times were Intellectual Capital (70), Organisational Learning (53), Human Resources Management (15), Information Management (13) and sense-making (12). The remaining keywords included a wide range of theories from humanities, social or natural sciences that were mentioned only a few times, mostly once (e.g. complexity theory, activity theory, theory of knowledge, game theory, grounded theory, organisational theory, systems theory, philosophy etc.).

Regarding research methods, only a very small number of keywords (247) explicitly specified these. The overall results in Table 3 suggest that out of those mentioned, about one half indicates theoretical and one half empirical methods. However, separate analysis by journals shows that JKM and KMRP articles are focused relatively more on empirical research, while JIKM and IJKM favour more theoretical research.

Among the most frequent empirical methods (repeated >10 times), case studies are noteworthy with a score of 52. Surveys and action research were also cited, but less frequently, 17 and 8 (<10) times, respectively. Other empirical methods covered a wide range of events including simulation, interviews, focus groups, meta-analyses etc. Theoretical studies focused mainly on conceptual models. Most

**Table 2** Referent disciplinary/theoretical approaches used by journals and sample

	JKM		KMRP		JIKM		IJKM		Total	
	No. <sup>a</sup>	% <sup>b</sup>	No.	%	No.	%	No.	%	No.	%
KM	571	72.01	50	19.76	94	30.42	87	53.37	802	52.83
Other	168	21.19	81	32.02	70	22.65	47	28.83	366	24.11
Total cited	739	93.19	131	51.78	164	53.07	134	82.21	1,168	76.94

<sup>a</sup>No. = number of keywords (count)

<sup>b</sup>% = percentage of total journal (or sample) articles

**Table 3** Research methods used by journals and sample

	JKM		KMRP		JIKM		IJKM		Total	
	No. <sup>a</sup>	% <sup>b</sup>	No.	%	No.	%	No.	%	No.	%
Theoretical	13	1.64	23	9.09	48	15.53	33	20.25	117	7.71
Empirical	40	5.04	40	15.81	33	10.68	17	10.43	130	8.56
Total cited	53	6.68	63	24.90	81	26.21	50	30.67	247	16.27

<sup>a</sup>No. = number of keywords (count)  
<sup>b</sup>% = percentage of total journal (or sample) articles

frequently cited keywords were ontologies and frameworks, 17 and 10 times, respectively. Other keywords referred to various types of models (e.g. structural, maturity, socio-technical etc.) and methodologies and techniques (e.g. analytical hierarchy, path analysis, scale development, weighted method etc.).

## 4.2 Analysis by KM Factors

In answering the second research question (what is the focus of KM research?) the KM factors addressed (see Fig. 3) were: (i) six KM elements (contexts, drivers, enablers, processes, stocks, outcomes) and (ii) two classes of KM elements (core and extended) discussed in the articles. Core KM included three knowledge-orientated aspects of KM (enablers, processes and stocks), while extended KM covered three business-orientated elements (contexts, drivers and outcomes).

The results of the analysis presented in Table 4 indicate that the research is more focused on core (knowledge-orientated) than extended (business-orientated) aspects of KM. The overall ratio of keywords for core and extended KM elements per article is about 2:1. However, Table 4 further shows that articles published in JKM exhibit relatively more balanced approaches (1.54:1.48) than those in KMRP (1.97:1.40), JIKM (2.32:0.97) and IJKM (3.08:1.27). This balance may have contributed to the highest impact factor achieved by JKM.

Further analysis by individual KM elements provided in Fig. 4 reveals that knowledge enablers (29 %) were the most discussed topic in the sample articles. Overall, 29 % of total keywords cited various knowledge enablers, 20 % processes and 10 % stocks. With respect to extended KM, business contexts were cited relatively more (24 %) than KM outcomes (12 %). KM drivers (5 %) were the least mentioned element of all.

Among most discussed social enablers (cited more than 20 times) were organisational/culture (68), followed by networks or communities of practice (54) and trust (22). Technical enablers were also discussed frequently. Among these, knowledge management systems (50) were dominant. Communication technologies (28), information technologies (27) and information systems (24) were also cited more than 20 times. With respect to research on processes and stocks, knowledge sharing (143) and tacit knowledge (65) were the most popular topics. In addition, generic learning/knowledge process/flow/practice



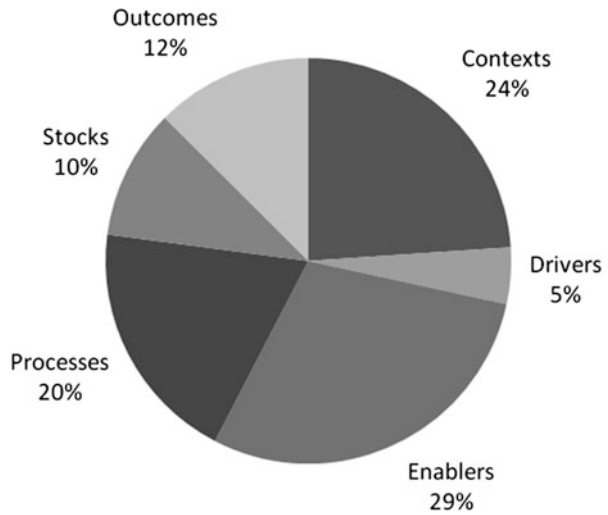
**Table 4** Classes of KM elements by journals and sample

	JKM		KMRP		JKM		IJKM		Total	
	No. <sup>a</sup>	Avg. <sup>b</sup>	No.	Avg.	No.	Avg.	No.	Avg.	No.	Avg.
Core	1,222	1.54	499	1.97	718	2.32	502	3.08	2,941	1.94
Extended	1,175	1.48	354	1.40	301	0.97	207	1.27	2,037	1.34
Total cited	2,397	3.02	853	3.37	1,019	3.30	709	4.35	4,978	3.28

<sup>a</sup>No. = number of keywords (count)

<sup>b</sup>Avg = average number of keywords per article by journal (or sample)

**Fig. 4** Six KM elements discussed in articles



(120), knowledge transfer (98), knowledge creation (67) and knowledge acquisition (21) were cited more than 20 times, as were explicit knowledge (27) and knowledge in general (26). The fact that social enablers were discussed more than technical ones suggests a greater KM scholars’ orientation towards “soft” KM programs (respecting the value of human judgment) rather than “hard” computer-based algorithms.

The most frequently explored contexts were organisations (37), small and medium enterprises – SMEs (31), business management (20) and project management (20). Among drivers, the nature of knowledge-based/intensive or learning organisation (57) was discussed most often, followed by knowledge/intensive work or workers (32) and knowledge/based economy (23). Extrinsic/intrinsic and employee motivation (21) was also addressed more than 20 times. With respect to outcomes, articles focused mostly on innovation (100), then on business/organisational performance (48) and competitive advantage (24).

### 4.3 Analysis by Author Factors

In answering the third research question (what are the characteristics of the KM research community?) this paper examined three author-related factors: (i) authors' regional affiliation (no. of articles per region) (ii) authors' collaborations (no. of authors per article) and (iii) authors' productivity (no. of articles per author).

The analysis of regional distribution of authors was based on 1,425 (out of 1,518) articles from which this information was successfully extracted by research assistants. Unfortunately, they failed to identify countries of origin from authors' affiliations in 6 % (93) of the articles where country names were not explicitly included. The available results are presented in Table 5. Overall, these results indicate that slightly more articles originated from Euro-Africa (32.74 %) than the Americas (26.55 %) or Asia-Pacific (24.97 %). Only a small percent of articles resulted from interregional or global collaborations (9.62 %).

Further analysis by journals reveals that all four journals cater for international scholars. However, they all show some bias towards their "local" region. Thus, two UK-based journals (JKM and KMRP) have more contributions from Euro-Africa, while Singapore-based JIKM and USA-based IJKM publish more authors from Asia-Pacific and the Americas, respectively.

Further analysis of individual countries within each region reveals that the USA (301) dominates the KM field in the Americas, the UK (132) in Euro-Africa and Australia (95) in the Asia-Pacific. These three countries also featured most often in interregional collaborations. Within regions, Canadian (46) authors were rather frequent contributors (>20 articles) from the Americas region. Aside from the UK, a substantial number of European authors came from Spain (42), Italy (39), Germany (38) and France (30). Authors from Greece (25), Finland (24) and Sweden (24) were also well represented. With respect to Asian authors, they mostly came from India (42), Singapore (36) and China (30), including Hong Kong.

Authors' collaborations were analysed by looking at authorship of each article in the sample. The results in Table 6 show that about two thirds of all articles were co-authored by two or more individuals (67.59 %), while one third (32.41 %) was from a single author. Among collaborative papers, most were written by two (35.44 %) and three (22.53 %) authors. A small percentage of papers was written by four (6.98 %) and five (2.11 %) co-authors. Less than 1 % of papers was contributed by six (0.46 %) and ten (0.07 %) individuals. Overall, these results suggest a widespread collaborative spirit of the community of KM researchers.

With respect to authors' productivity, the study examined how many articles were published in sample journals by different authors. The results in Table 7 indicate that the overwhelming majority of 88.73 % authors published only one article per journal. Among the returning authors, 8.55 % published two, 1.53 % three, 0.65 % four and 0.27 % five articles. Less than half percent (0.27 %) of authors published six or more articles. These results suggest that the sample distribution conforms to the principles of Lotka's Law (Wallace 2012). This law states that the number of authors producing more than one article follows an inverse square function of those making one publication.

**Table 5** Regional affiliation of authors by journal and sample

	JKM		KMRP		JKM		JKM		Total	
	No. <sup>a</sup>	% <sup>b</sup>	No.	%	No.	%	No.	%	No.	%
The Americas	191	24.09	70	27.67	75	24.27	67	41.10	403	26.55
Euro-Africa	286	36.07	122	48.22	57	18.45	32	19.63	497	32.74
Asia-Pacific	169	21.31	32	12.65	138	44.66	40	24.54	379	24.97
Interregions	63	7.94	29	11.46	30	9.71	24	14.72	146	9.62
Total cited	709	89.41	253	100.00	300	97.09	163	100.00	1,425	93.87

<sup>a</sup>No. = number of articles (count)

<sup>b</sup>% = percentage of articles by journal (or sample)

**Table 6** Authors per article by journal and sample

Authors	JKM		KMRP		JKM		JKM		JKM		Total	
	No. <sup>a</sup>	% <sup>b</sup>	No.	%	No.	%	No.	%	No.	%	No.	%
1.	285	35.94	85	33.60	84	27.18	38	23.31	492	23.31	492	32.41
2.	263	33.17	90	35.57	123	39.81	62	38.04	538	38.04	538	35.44
3.	176	22.19	51	20.16	72	23.30	43	26.38	342	26.38	342	22.53
4.	50	6.31	23	9.09	20	6.47	13	7.98	106	7.98	106	6.98
5.	14	1.77	3	1.19	8	2.59	7	4.29	32	4.29	32	2.11
6.	4	0.50	1	0.40	2	0.65	0	0.00	7	0.00	7	0.46
10.	1	0.13	0	0.00	0	0.00	0	0.00	1	0.00	1	0.07
Total articles	793	100.00	253	100.00	309	100.00	163	100.00	1,518	100.00	1,518	100.00

<sup>a</sup>No. = number of authors per article (count)

<sup>b</sup>% = percentage of articles by journal (or sample)

**Table 7** Articles per author by journal and sample

Articles	JKM		KMRP		JKM		JKM		JKM		Total	
	No. <sup>a</sup>	% <sup>b</sup>	No.	%	No.	%	No.	%	No.	%	No.	%
1.	1,202	87.16	404	87.64	414	92.00	295	92.48	2,315	88.73		
2.	128	9.28	48	10.41	28	6.22	19	5.96	223	8.55		
3.	27	1.96	7	1.52	4	0.89	2	0.63	40	1.53		
4.	12	0.87	1	0.22	2	0.44	2	0.63	17	0.65		
5.	6	0.44	1	0.22	0	0.00	0	0.00	7	0.27		
6.	2	0.15	0	0.00	1	0.22	1	0.31	4	0.15		
7.	2	0.15	0	0.00	0	0.00	0	0.00	2	0.08		
8.	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00		
9.	0	0.00	0	0.00	1	0.22	0	0.00	1	0.04		
Total authors	1,379	100.00	461	100.00	450	100.00	319	100.00	2,609	100.00		

<sup>a</sup>No. = number of articles per author (count)<sup>b</sup>% = percentage of articles per author by journal (or sample)

The most prolific authors (with more than five papers) in JKM are: Kostas Metaxiotis (7), Francisco Carrillo (7), Kostas Ergazakis (6) and Nick Bontis (6). Ramaraj Palanisamy (9) and Suliman Al-Hawamdeh (6) are the greatest contributors to JIKM, while Murray Jennex (6) is the most published author in IJKM. Jonathan Klein (5) is the only author with a similar number of papers in KMRP. The analysis further revealed a notable absence of authors who are considered the most influential in KM (Edwards et al. 2003). Thus, only one contribution was found by Nonaka in KMRP and Davenport in JKM.

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## 5 Discussion

In summary, this study contributed two main findings. Firstly, it answered some basic ontological and epistemological questions concerning the field of KM; and secondly, it portrayed the picture of the KM research community, based on influential publications over the past 15 years.

### 5.1 KM Research Trends

With respect to theoretical foundations underlying KM research, this study found that they are nearly equally divided between KM and various reference disciplines. The fact that half of research is built on KM foundations is encouraging, as this can enable conducting research on KM issues in a holistic manner. The reliance on integrative approaches to KM is advocated by many authors (e.g. Holsapple 2003; Handzic and Hasan 2003). Current literature offers a wide variety of harmonised KM frameworks that can serve as a solid basis for future research (Heisig 2009) and progress in the field.

Among reference disciplines, the majority of articles approached the KM issues from the perspective of organisational learning, others concentrated on Earl's (2001) economic perspective of intellectual capital and the behavioural perspective of human resources management. While these referential approaches have been developing separately in parallel with KM, it is possible to bring them under the KM umbrella, by treating organisational learning as KM at the organisational level, intellectual capital as the stock aspect of KM, and human resources management as dealing with human aspects of KM. Nevertheless, finding a way of uniting these and various other approaches used in KM research remains a challenge.

With respect to research methods used, this study found out that they are similarly split between conceptual and empirical. However, due to a small sample, it is hard to make any firm conclusions about methodological preferences in KM research without deeper analysis of each individual article. Nevertheless, the most frequently named method gives us a hint that "case studies" were the most popular method. Such a finding suggests that empirical research in KM is dominated by an interpretivist orientation over the positivist approach.

Given that KM is a young scientific field, it requires a great deal of exploratory and theory building research via case studies. Thus, a greater emphasis on such research compared to theory testing and/or refinement via surveys is expected. The strength of case studies is in that they allow the examination of complex phenomena in natural settings, however, they are weak for making causal inferences (Miles and Huberman 1994). Therefore, future KM research should “triangulate” in order to enhance the validity of current findings. In addition, it might be helpful to readers if the list of keywords associated with articles always included their theoretical basis and method of research.

This study also examined the focus of KM research. KM focus may be an important factor in determining its professional relevance. It is believed that an applied field of research like KM needs to carefully balance knowledge management and business management aspects since they inform each other.

The current analysis revealed that the issues that preoccupied KM researchers mostly concern the core elements of KM. Here, the term KM is understood as a complex, multilayered and multifaceted concept and is scoped to include three core (knowledge-orientated) and three extended (business-orientated) elements. The core elements were discussed in terms of various socio-technical knowledge enablers, processes and stocks. The most frequently discussed knowledge stock was of tacit type, the most frequently mentioned process was knowledge sharing, and the most frequently named social and technical enablers were organisational culture and knowledge management system (KMS). They were examined mostly in organisational contexts, including SMEs, and within general or project management activities. In this review, SMEs were featured more prominently than in other recent reviews based on ProQuest data (Durst and Edvardsson 2012). Such findings are encouraging, given the prevalence of small and medium-sized enterprises and a strong need for more research on this important topic.

Nature of knowledge (based) or learning organisation was most frequently cited as a driver of KM, while innovation was mentioned most frequently as an outcome of KM. This is consistent with the post-industrial worldview of a knowledge era (Drucker 1993) in which mobilising knowledge assets is the only way to ensure continuous advancement and/or survival. However, there was much less discussion about business drivers and outcomes of KM than other issues. Yet, aligning KM with business strategies and linking KM to business performance is essential if the field is to remain relevant to practice (Hansen et al. 1999).

One possible explanation for the current findings may be that there is a general agreement among KM scholars that KM needs to align with business strategy. If so, there would be no need for authors to mention this as a keyword because it would not be part of the novel contribution. It is also possible that KM scholars have taken for granted that KM produces benefits without investigating these issues. If so, future research may address this limitation through the next generation of KM that would move away from mainstream KM towards the convergence between KM and transdisciplinary research (Cummings et al. 2013).

Right now, research orientated towards innovation, tacit knowledge, and sharing and culture is considered most valuable for developing innovative advancement strategies and achieving competitive advantage (Von Krogh et al. 2000).

## 5.2 KM Research Community

All sample articles examined in this study were regular research papers whose authors make up the KM research community. The study portrayed its members as truly international and highly collaborative researchers, but not very productive contributors to KM journals.

With respect to regional affiliation of different authors, the study found out that they are similarly split between the Americas, Euro-Africa and the Asia-Pacific. However, further analysis revealed that the majority of authors show some preference for publishing their research in journals based in their local regions. Only a handful of authors have papers in all four journals. This may be attributed to researchers' greater interest and focus on local contexts and problems than on global issues in KM. The earlier reported dominance of case studies as a method of research provides further support for this assumption. In addition, research carried out with a concern for local context may be seen as having higher practical relevance. However, academics need to maintain a balance between their exposure to local and global issues in KM.

Further analysis of articles by authors suggests a highly collaborative nature of KM researchers. This is evidenced by a two-third majority of co-authored articles. Most of these are written by two or three authors. However, these co-authorships are limited to intra-regional, rather than inter-regional or global collaborations. Only about 10 % of all articles resulted from collaborative efforts of researchers from two or three different world regions, namely the Americas, Euro-Africa and the Asia-Pacific.

Regarding authors' productivity as writers for KM journals, this analysis reveals that the overwhelming majority of authors (89 %) published only one paper in any one of the examined journals (JKM, KMRP, JIKM and IJKM) over the past 15 years. While the current productivity finding following Lotka's Law is not unusual for any scientific field (Wallace 2012), the lack of ranked journals before 2009 and indexed journals before 2012 may be partially responsible for the prevailing one paper per author. An attempt was made to find out how this compares with more established journals in management and information systems, but no data were readily available.

Another disappointing finding of this investigation is a visible scarcity of contributions from the "founding fathers" of KM in top KM journals. The reason for this may be that their most influential work dates back to the time when no indexed KM journals existed. However, the presence of several new names is indicative of the possible rising of "KM stars". It is hoped that these "new kids on the block" will sustain the academic interest in KM and advance the discipline into the next decade.



“Publish or perish” is a dire warning to both current and prospective KM researchers and they should all seek to publish in reputable outlets. Currently, peer-review publications in SSCI indexed journals such as JKM and KMRP represent the standard for one’s credibility as a researcher. They are also required for faculty advancements, promotions and tenure at most universities (Serenko and Bontis 2009). Therefore, a decreasing trend in a number of publications since 2008 was a surprising finding of this study. However, a follow-up page count discovered that this was only a consequence of articles becoming longer. This could mean that more recent papers tended to address more complex issues in a more comprehensive manner. Such suggestion is in line with Serenko’s (2013) finding that KM exhibits attributes of a healthy academic domain with no apparent anomalies and is progressing towards academic maturity.

Overall, all current findings need to be interpreted and applied with caution due to limitations in the selection of sample journals, theoretical framework, focus on the keyword rather than full text analysis, and subjective classification of words. Future research is needed to address these limitations and extend current research to a more comprehensive investigation of a wider range of specialised publication outlets in KM, including books and conference proceedings.

## Conclusions

This chapter has reported the results of a project aimed to critically examine KM research trends and the KM research community based on articles published in four top KM journals in the period from 1997 to 2012. The reported descriptive analyses throw some light on the issues and concerns that motivated the study. Amongst the main findings, the analysis indicates:

- KM research is grounded in both KM and non-KM theories;
- Studies are equally split between theoretical and empirical;
- Empirical research is dominated by the interpretivist over positivist paradigm;
- KM research is mostly focused on knowledge enablers and flows within organisations and management processes
- Low focus on business drivers and outcomes is a major shortcoming of KM scholarship and its practical relevance
- The KM community consists of individuals who are well connected regionally, but are not noticeably active as writers for KM journals.

These findings provide KM researchers with opportunities for reflection and assessment of their research. They also serve as signposts for defining future research agendas to ensure that the field of KM prospers.

It is hoped that this research may help KM researchers in understanding the trends in KM research, suggest future research opportunities and improve the quality and relevance of their research.

In particular, it is important that KM researchers focus more on drivers and outcomes of KM as these factors have had relatively little research attention so far, yet they are central to current KM investment decisions.

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## **Part II**

# **Acting in Present**

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# Knowledge Management in the Public Sector: UK Case Study Perspectives

Sandra Moffett and Tim Walker

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## 1 Introduction

History shows that most management philosophies were first practiced in the large company (McAdam and Reid 2000) and once they gained acceptance they become adopted in the other sectors, including government. Programs such as those associated with New Public Management (NPM) suggest that public organisations should import managerial processes from the private sector, emulating their successful techniques. Examples include enterprise resource planning (ERM), business process re-engineering (BPR), total quality management (TQM) and Knowledge Management (KM). KM has for sometime been at the core of government tasks, inseparable from strategy, planning, consultation and implementation (OECD 2001). Governments are now realising the importance of making KM explicit to policy-making and service delivery to the public, with some government departments beginning to put KM high on their agenda, however evidence drawn from the existing literature suggests that public sector is still falling behind in these practices (Cong and Pandya 2003). KM implementation is challenging, strategies and plans for implementing KM must be carefully planned in advance to succeed in the attempt and effort; challenges will not be met without adjustment. There are concrete issues for government to consider and address, such as raising awareness, understanding the KM concept, managing knowledge processes, choosing initiatives that are fit for purpose, gaining and adding value to public services.

The essence of managing knowledge is concerned with deciding with whom to share, what is to be shared, how it is to be shared, and ultimately sharing and using

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it. Managing knowledge produces value when shared knowledge is used and reused. Consistent value occurs when there is an atmosphere of trust and motivation for people to share and use knowledge, when there are systematic processes to find and create knowledge, and, when needed, there is technology to store and make knowledge relatively simple to find and share (CIO Council 2001). KM involves systematic approaches to find, understand, and use knowledge to achieve organisational objectives. Managing knowledge creates value by reducing the time and expense of trial and error or the reinvention of the wheel (CIO Council 2001).

The management of knowledge is of increasing importance for governments in dealing with the challenges created by the knowledge economy. These challenges are addressed in the following aspects (OECD 2003):

1. Knowledge has become a critical determinant of competitiveness for the public sector. Service delivery and policy making are the main tasks for government. In a knowledge economy, governments are increasingly facing competition in these areas at both international level and national level. In the public sector, goods and capital is not as important as in the private sector, but knowledge is. In this setting, knowledge is both an important element of competition between organisations/ departments and is a central resource of the government. Effective functioning of government rests on effective acquisition and dissemination of knowledge.
2. Private firms produce goods and services that are increasingly intensive in intangible capital, directly competing with the public sector for the delivery of goods and services such as education, science, security and knowledge. As customers demand and receive more customisation from knowledge-oriented private firms, they would also expect similar benefits from the public sector.
3. Retirement of civil servants and frequent transfer of knowledge workers across government departments also create new challenges for the retention of knowledge and preservation of institutional memory and the training of new staff. There is also competition for talent with the ability to share knowledge. Succession planning is key within the public sector for knowledge capture and dissemination.

KM is based on the idea that an organisation's most valuable resource is the knowledge of its people, the essence of KM is 'getting the right information to the right people at the right time' (Davenport and Prusak 1998). Therefore KM has potential to strengthen government effectiveness and competitiveness in the current changing environment. The aim of this chapter is to present findings from three public sector cases exploring KM implementation. Case organisations were asked to comment on items that may support or hinder KM adoption, these are presented in Table 1.

Each organisation was contacted via a gatekeeper and invited to select up to six key personnel involved in KM implementation. Interviews were arranged with each of the participants, each interview lasted between 1 and 2 hours. Interview transcripts

**Table 1** Factors for KM implementation

Theme	Factors
Macro-environment	External factors
Organisational climate	Teams
	Adopting new approaches
	Collaboration
	Employee welfare
	Informal practice
Technical climate	Environment
	Infrastructure
	Communication
	Repositories
	Connectivity
Technology	Access
	Knowledge roles
	Training
Technology tools	Training location
	Intelligent tools
	Support tools
Information	Web-based tools
	Information flow
	Information systems
People	Information capture
	Employee emancipation
	Working practices
	Innovation
	Reward

were taped, typed and analysed using Nvivo, qualitative comments are selected to support key findings, these reinforce current KM literature.

## 2 The MeCTIP Knowledge Management Model

Holsapple and Joshi (1999a) made a comparative analysis of key KM frameworks available in the literature and argued that none of these researchers appeared to subsume all of the others as each of them addressed certain KM elements. The MeCTIP Knowledge Management model, (the MeCTIP model) created by Moffett et al. (2002), attempts to overcome this shortfall by considering a broad range of aspects which contribute to KM implementation, these are summarised in Table 2.

Moffett et al. (2002, 2003) grouped these into five key categories that can either support or hinder KM implementation, forming the basis of the MeCTIP model (shown in Fig. 1). MeCTIP is an acronym of model components, namely Macro-environment, Culture, Technology, Information and People.

All organisations (irrelevant of sector or status) must be aware of external, macro-environmental factors that will have an impact on organisational climate/

**Table 2** Key contributors to KM

Title	Theme	Content	References
Macro-environment	Economic, technical and social agents of change	Includes globalisation and the recession, emergence of new technology such as the Internet, market orientations	Johnston (2009) Obeng and Crainer (1996) Ward (1994)
Internal organisational development	Culture and organisation climate	Includes organisational structure, strategy, goals, culture, employee emancipation, change management and business improvement initiatives	Vorakulpipat and Rezgui (2008) Moffett et al. (2003) Davenport and Prusak (1998) Lank (1997)
Overall management approach	Link between strategy and operations	Includes business improvement initiatives (TQM, the Learning Organisation, Business Process Re-engineering), continuous improvement, leadership and facilitation, knowledge-orientated direction	Fernandez et al. (2006) Moffett et al. (2003) Normann (2001) Davenport and Prusak (1998) Powell (1995)
Customer focus	Interface between internal operations and customer/client	Includes satisfaction, loyalty, customer relationship management	Johnston (2009) Johnston and Clark (2001) Liljander and Strandvik (1997)
Quality focus	TQM, Business Process Re-engineering, production improvement	Includes production and manufacturing processes, service delivery, outsourcing, partnerships and alliances, new product design, research and development	Fernandez et al. (2006) Moffett et al. (2003) Kurland (1992) Crosby (1979)

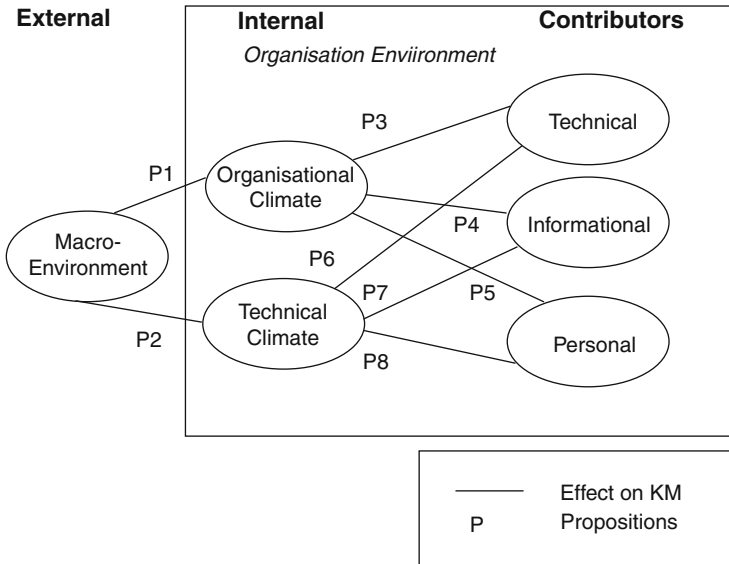
(continued)



**Table 2** (continued)

Title	Theme	Content	References
Knowledge focus	KM concepts, tools and applications, implementation, knowledge drivers of change	Includes tacit and explicit knowledge, knowledge roles, knowledge-based systems, information management, employee emancipation	Borges Tiago et al. (2007)
			Dunford (2000)
			Davenport and Prusak (1998)
			Quintas et al. (1997)
Technical focus	Internal technical climate, technical contributors to change	Includes technological infrastructure, response to technical change, system standardisation and compatibility, technical usability, technological tools and software applications	Jennex (2005)
			Davenport and Prusak (1998)
			Shenk (1997)
Informational contributors	Creating, storing, disseminating and using information	Includes information fatigue, infofamine, infoglut, knowledge silos and power-bases and information auditing	Ajmal and Koskinen (2008)
			Borghoff and Pareschi (1999)
			Offsey (1997)
Personal contributors	Human Resource Management, people and working practices	Includes knowledge roles and skills, motivation and self-reflection, empowerment, learning networks and communities of practice, dialogue, collaboration and innovation	Sarros et al. (2008)
			Lustri et al. (2007)
			Scarborough et al. (1999)
			Zuboff (1998)
			Peters (1992)

culture and technical climate/infrastructure, both of which further impinge on technical, informational and personal processes internally. A successful knowledge-orientated organisation is one which has strong information practices and technical resources to support employees in decision making processes. The MeCTIP model is a conceptual model to aid organisations (public and private) visualise KM implementation. Relationships between each model component are proposed, for example P1 claims that factors in the macro-environment (such as the internet) will have an impact on organisation climate (the way people work) while P2 extends this relationship to technical climate (technological infrastructure). Statistical analysis of the strength of proposition relationships is currently underway, however for the purpose of the study in hand the MeCTIP model was used as a visual to introduce interviewees to items relevant to KM implementation.

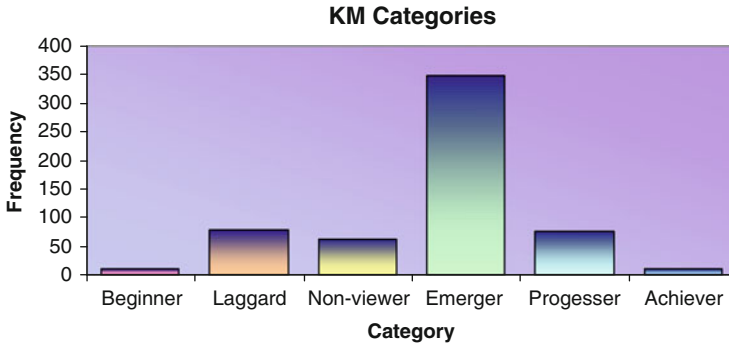


**Fig. 1** The MeCTIP model

### 3 Research Methodology

The MeCTIP model informed the development of an on-line survey based measurement instrument, known as the 'Benchmarking KM' tool, available at <http://www.business.ulster.ac.uk/questionnaires/moffett/> (last accessed 28/12/2013). The survey is similar to KPMG's Knowledge Management Framework and Microsoft's IT Adviser for Knowledge Management (Kruger and Snyman 2005). Quantitative research was undertaken with 588 UK organisations from both public and private sector and used for organisation size comparison (Moffett et al. 2011) and organisation sector comparison (Moffett and McAdam 2009), details of the statistical analysis process and results can be obtained from Moffett and McAdam (2009), Moffett and Hinds (2010).

For each respondent organisation, a total score for KM was derived based on cultural, technological and informational scores. Organisations were classified as either poor (three low scores, or two low and one medium score), developing (two medium and one low score, or three medium) or potential (one or more high score in any category). The process of categorisation is similar to that adopted for KM maturity knowledge management maturity statements formulated by authors such as Boon (1990), Kruger and Snyman (2005), Ndlela and Du Toit (2001) and Zack (1999). When grouped according to these classifications 27 % of respondent organisations are deemed poor at KM, 15 % have developed some KM initiatives, though the approaches were ad-hoc and not part of a strategic KM plan (more by



**Fig. 2** KM categories

chance than with vision) and 57 % exhibited KM potential, where at least one category scored highly showing success at KM activity.

Taking this a stage further participant organisations were re-classified based on KM categories. Depending on the activity undertaken, strategic and operational vision, and success to date organisations were categorised as beginners, laggards, non-viewers, emergers, progressors and achievers. Figure 2 shows the results of this categorisation, this figure relates to all 588 empirical respondents from both public and private sectors.

The results of the KM categories indicate that:

- Two percent of respondents are ‘**beginners**’ with little KM implementation
- Fourteen percent are deemed to be ‘**laggards**’, they have low focus on at least two of the three elements necessary (technology, information and people) for KM implementation.
- Eleven percent have a key driver for KM implementation, receiving a high score in one element, but are not seeing the bigger picture ‘**non-viewers**’ which requires focus on all three elements
- Fifty-nine percent scored medium on either two or three of the elements showing that some form of KM implementation was in motion ‘**emergers**’, this activity needs to be nurtured to move towards progresser/achiever status
- Thirteen percent are organisations with high KM activity in two of the elements ‘**progressors**’. While these organisations will see benefit to KM implementation the third element in which they are lacking needs attention.
- Two percent are deemed ‘**achievers**’ received a high factor score in all three elements. These organisations should be exemplars of KM implementation and practice.

Statistical analysis to compare private sector and public sector organisation is currently underway, however for the purpose of this chapter KM categorisation was used to aid selection of case organisations.

## 4 KM in Public Sector Cases

Further support for quantitative findings was derived from qualitative cases. As part of the quantitative data collection organisations were asked to express an interest in participating in further research identifying a contact person as gatekeeper. From the 588 organisations employed in the empirical study 53 % expressed an interest in further research. A number of organisations, from both public and private sector, were selected for further investigation. One public sector organisation based at each stage of the KM category continuum was selected for further qualitative investigation, the three most advanced in KM implementation are reported in this chapter. Contact was made with the organisation gatekeeper (person who supplied contact details on the survey response indicating willingness to participate in further research) to arrange visits, he/she was asked to nominate up to six people in the organisation most knowledgeable in KM. Each participant was interviewed face-to-face in line with the in-depth approach recommended by Yeo et al. (2014) and interviews typically lasted between 1 and 2 hours with each being recorded following permission from the interviewee. Within one week of the interviews, taped content was transcribed and analysed via NVivo to identify key content. Qualitative comments were extracted to support key findings. Organisation documentation, such as IT and HR policies were also reviewed to support interview findings. The remainder of this chapter focuses on three cases within the public sector, as shown in Table 3.

In keeping with the theme of this chapter, components of the MeCTIP model will now be discussed from a qualitative viewpoint. Interviewees were prompted to focus their responses based on MeCTIP model components, namely macro-environment, organisation climate, technical climate, technology, information and people processes.

### Case 1: Organisation E, Higher Education

Organisation A is a higher education (HE) provider based in Southern England. Originally a Further Education College, they entered the HE sector in 2001. Company A has approximately 350 staff, 250 of whom are core staff. Each year they recruit approximately 950 students, which is full capacity, from on average of 4,000 applicants. Students are recruited from all over the UK, plus approximately 10 % are international (non-EU). There is an acceptance amongst potential students that there is competition for places, the University has a good reputation which they have worked hard to build and promote.

Four interviews were conducted within this organisation, as shown below:

Overview of interviewees coding	Role
A1	Director of Finance, MIS, Enterprise and Knowledge Transfer
A2	Human Resources and Employee Relations Manager
A3	IT Manager
A4	Director of Academic Services

**Table 3** Case study participants

Case no	Sector	KM implementation stage	No of interviewees
1 – A	Higher education	Emerger	4 – coded A1 to A4
2 – B	Public Health Department	Progressor	5 – coded B1 to B5
3 – C	Waste management	Progressor	6 – coded C1 to C6

**Macro-environment**

As Company A are focused on building their reputation, they are very aware of external factors, such as current students, alumni and potential markets. A lot of effort goes into marketing their courses, promoting their successes and ensuring all publicity is good. They are aware of competition and the offerings of similar institutions in the area. Part of this promotional activity surrounds their location; it is a beautiful campus, with great office space, built to take advantage of natural light (utilising features such as glass ceilings) with landscaped gardens. Company A operates on a healthy turnover, with each department granted a budget for internal activity. A3 outlines that the current credit crunch has not had an impact on the organisation. The environment greatly contributes to the culture of the organisation.

**Organisation Climate**

In an opening comment about Organisation Climate A4 declares *‘We’re blessed!’*. Senior management have a close working relationship, as A4 outlines *‘We have some extremely competent and nice, personable senior managers, who I will happily chat to for 10 minutes if I bump into them in the corridor, rather than thinking we’ll just talk about finance things and then run along. There is no sense here of ‘who is the first among equals?’* All in the senior management team have a role to play in terms of leading and managing their own areas, and in jointly thinking about the strategy and the good of Organisation A as a whole, *‘It’s also true that we do share a vision, and that’s quite important. I think there is also a sense of the institution as a whole becoming more mature, and having confidence in itself’*. Interviewee A3 promotes the role of a champion in gaining shared vision, *‘The new Principal is the force, in terms of the visionary. Whilst all the senior managers feed into it, the Principal has been very clear, almost to the point of ‘if we don’t do this, we are gone’. I don’t know if you can sense it, but the sense of community here is so nice. And when there was that key, single focus driver (recent audit), everybody was doing stuff towards it; there wasn’t a member of staff going ‘no, my job is nine to five’. Everybody was focused’*.

As reporting lines are short, senior management know all of their staff, as A3 declares, *‘Here the Chief Exec knows my name. The relationships are just nice’* and understand the roles they play. As A4 states, *‘we are quite good at acknowledging that everyone has a role to play. Of course nobody is indispensable, everyone can be replaced. But one person can’t replace everyone. I have never assumed I can do everything, so I don’t know if people treat me differently as a result’*. Channels of communication within the organisation are open. Although staff are encouraged in

the first instance to speak to their line manager, they can approach senior management if necessary. A4 outlines that this open door policy actually reduces communication *'They used to come to me a lot more than they do now; I think now that they appreciate that it is there, but don't feel a need. You only use it when you need to. I hope . . . I believe that people think that I'll always make time for somebody'*.

One of the challenges Company A has faced is getting all staff to recognise the importance of documentation for recording events and auditing purposes. Reflecting on how policies and procedures currently stand, A4 outlines, *'they're not bad; they are effective; they take us where we need to go'*. However he also states that *'Fresh eyes could just completely throw some of the rubbish in there out'*.

Interviewee A4 tells the story of how he gained trust from staff members on joining Company A, changing a blame culture to an open one, *'When I started I simply asked questions. I was able to ask what the risks were what are the great strengths, what are the managers like in your view? I also asked the managers straight away 'how do you feel about your area, and what are its biggest strengths, and what are its biggest risks?' I wanted to know from everybody what do I need to do – for you, what are the most important things I can do, and what are the biggest risks in your area, what is going to prevent you being successful over the next three to five years? Luckily we have a very well behaved organisation in the first instance; I was blessed with managers who believed the best of me and were ready to run with it and to give me the benefit of the doubt. I suppose I was trying to build confidence, but to a certain extent I was trying to find out what was going on at the same time, I think also, because it is a relatively small organisation, it is relatively easy to work out who the key people are, although I was, in one instance, misled. Also, of course, other senior managers have views. Whilst they weren't always right in every respect, you get to know fairly quickly who you rate in other teams'*. Within the organisation there is a team orientated culture. Leaders have flexibility to organise teams as they see fit. As the environment is open planned, with only Directors having their own offices, team members tend to integrate well. A3 outlines *'There is a camaraderie'*.

However, people do not tend to work across functional areas, resulting in knowledge silos, as A3 suggests, *'One of the things we do lack is shared resources, there are pockets of expertise. Because someone has worked on something as a project they have an awareness, but don't necessarily have the depth'*. However, A3 does go on to outline that team spirit is strong within groups, stating *'If a project fails, outside of this room we will look bad. And what we will protect is the honour of [name of department]. Everybody out there has gone through project management training as well, so we all understand that they're a piece of the jigsaw, and if they drop the ball they've destroyed it. I think that helps in terms of the communication. They know we are on the critical path on one project, or we have produced the project board that shows what is going on'*. One barrier to motivating staff is the lack of reward mechanisms, a point outlined by A1, *'When I was in private industry you could reward someone who was working better, but here it is very restrictive – you have increments, and someone might deserve two increments, but they can only*

*get one*'. A3 also comments on the lack of rewards, deeming academia to be a vocation rather than a career.

The strong Organisation Climate in Company A tends to be key for recruitment and retention of both students and staff alike.

### **Technology**

The IT department have great alignment with the integration of information, as A3 outlines, *'while we look after the servers and all the rest, and MIS want to take information from those, there is great synergy of trying to bring together what they wish to achieve and what we can provide, and in some respects the future now is very much all about system integration and devolving the workload'*. One of the prerequisites at the tender stage for system design was to ensure that the reporting tool employed could *'talk, integrate, grab bits of data to give management the report that they wanted, not caring where the information came from'*.

A3 outlines some of the challenges IT is facing in terms of system integration while meeting the demands of students and industry, *'In some respects, the cultural issue is the one that is hitting academics. The thing that we struggle with here is the academic development of IT. Students bring in their own laptops. We have moved the funding that was buying those desktop computers in the studio to the wireless, making that environment much more secure through intrusion detection systems and security measures, etc. What we are finding now is that students don't want the low end; they just want the high end kit. So our investment now is in much more specialised equipment, that's the movement. That is something I am struggling with. In business, the way the infrastructure is going is mapped out quite nicely. On the academic side, it is getting harder to build in that academic response. They kind of know what they want to do, but don't know quite how to do it. Then they meet someone from another organisation, and want to buy what they have. It's very spontaneous'*. One of the pressures facing technology is being able to provide resources that are leading edge in industry and able to meet the demands/expectations of the student population.

All staff has access to the Internet, intranet and emails. When a user logs on to any IT system the default page is the organisation's intranet, displaying any recent, relevant information: *'swine flu has hit, go home, whatever – will be presented to you'*. All policies and procedures are available via the intranet, presented in alphabetical order. Electronic versions of documents such as minutes of meetings are also logged there. Within the HR section recruitment vacancies are also presented, though internal vacancies are password protected. Although Organisation A is relatively small, staff depend on email for communication; email is accessed from the intranet, which provides the opportunity for connection from any location. Internet usage is not policed, though there are *'particular sites that people shouldn't go to; we would clamp down on that. We don't purposely police people browsing the internet, but it's a manager's decision if they feel that people are not getting their work done. As long as the work gets done, it shouldn't be a problem'* (A4). Enabling students to use Internet resources is also encouraged, *'We are encouraging each of our courses to set up a less formal website that is*

*much more about student work, and let it have a more student feel, have their own blogs, alumni talking, etc. Students self-manage their webspace, it's kind of 'see what the students say'. We're very cautious of Twitter and Facebook, over what is being said on there. We monitor it as we have had one naughty experience' (A1).*

However, keeping momentum going is taxing. As A1 declares, *'There seems to be an initial excitement, and then organisations become complacent'* while A3 states, *'What I like here is that we don't talk about IT. It really annoys my colleagues, but I feel that IT shouldn't even be mentioned; it should just work. It's like your car: it's supposed to start every morning and take you somewhere. You don't thank your car. It's just a given. But when it breaks you realise how much you depend on it. For me, that is IT'.*

Summarising the IT challenge A3 states, *'I am interested in terms of the integration story. I think that is the key thing in our organisation at the moment. This is our utopia, to have all the systems integrated; information is the key'.*

### **Information**

A4 outlines the information strategy, *'we wrote ours three or four years ago – we took a year writing it, going backwards and forwards, working out what we wanted to do – and it's a real, living document and strategy. And we are doing what it says we are going to do. We have identified who the lead owner is for pieces of information. What that means is, the person who owns it knows they shouldn't throw it away, and everybody else knows they can. For me, that is really important. One of the issues I have, especially in a smaller institution, you feel you have to remember everything all the time. And you can't. If I kept every piece of paper that came into my office, I'd need five times the number of files I have. What is important to me is I know what I need to keep, and what someone else knows and so I don't have to worry about any more. So I just need to know about the top level stuff, so we can integrate things better, so we don't operate in silos but in a genuinely joined-up way, but no one individual needs to know all the bits of the joining up'.*

To kick start the information strategy development, the senior team undertook an information audit and reviewed information strategies from other companies. Cherry picking the best bits from these, and redrafting to suit their organisation in an iterative process, led to the formation of a comprehensive document which included a retention schedule for documentation: what to keep, who keeps it, what format do they keep it in. Simultaneously, there is a destruction schedule. This proved to be invaluable as immediately the organisation was able to *'truck away skip-loads of stuff, especially where students were concerned. We had sick notes from 1953! We are gradually hoping to digitise. We are not terribly far along on this yet. What we are working on at the minute is making sure that every new document is available electronically. From now on, we will endeavour as far as possible to keep electronic records of everything'.*

Company A have adopted a pull strategy for information flow, documentation is available electronically, people are made aware of its existence, and it is up to individuals to locate and read it. A4 outlines *'I'm more worried about knowledge overload, almost, than underload. You get so much rubbish via email. Everyone's*



*busy trying to do their jobs. Actually, you want people just to focus on what they need to know, and make them take ownership of what they need to know, and make that easy for them. Other stuff is useful background. You are more likely to be effective if you can keep people knowing what they need to know, and what is related to that'.*

Within Organisation A the most common used term is management information systems – MIS. In terms of data accuracy for information management Organisation A claims to have *'99 % accuracy, without a shadow of doubt. People care about what gets inputted. Because our systems are new, the legacy has been cleaned so many times before it gets into the system'*. Future aspirations for information processes is stated by A3, *'Certainly our intention is self-service, business efficiencies, and, if you like, to make the back end as efficient as possible, as money saving as possible, and therefore allowing our funds to do what we can academically. I am under no illusions from business support that that is the goal, to spend our money as strategically as possible, and to buy high end resources that our students need, resources that aid information flow and management'*.

## **People**

Organisation A operate standard working practices, such as statutory sickness and maternity policies. The majority of staff on the business/support side work set hours, 8.30 to 5.00, finishing at 4.30 on Friday. Flexi-time is at a manager's discretion. Family commitments are normally accommodated following a business case application for concessions. On the business side, flexible working practices such as job sharing or reduced hours can be accommodated easier than on the academic side. Academics tend to work long hours during term time with more flexibility at other times of the year. Organisation A promote work-life balance and are supportive to individual circumstances.

Organisation A recruit graduates and find the pool of applicants to be strong. Staff turnover is at or below average. Turnover is viewed as a positive occurrence as it brings fresh ideas into the organisation. People who leave do so because they are ambitious or their family circumstances have changed. When probed on the reasons people would choose to work for Company A, A4 commented, *'I am sure there is a certain lifestyle attached to living here that people don't want to give up. I also think there is an incredible commitment to the students. You see the hours they work. I think that's a major part of it. They really love it; they really believe in what they do. This is a recognised place of excellence. People are really committed to this place. I knew as soon as I had my interview that I really wanted to work here. I think what I like is that you can be yourself here. Coming from my previous post, where I had to be a corporate robot, and couldn't show any emotion . . . Here you are allowed to have a bad day, to be yourself. Not to the point of being unprofessional, but I think that is what makes it. And it is quite friendly and respectful. Having that previous experience really makes me appreciate that it is a good place to work'* while A2 declares, *'If you like a challenge this has been the place to be. It's been very interesting and quite fulfilling. And frustrating at times!'*

Organisation A has a general induction for all new staff in the form of a standard monthly induction meeting. On the first day they would be met by their manager, they would be assigned a mentor, and a buddy. The mentor will be from the academic side of things, in another area; the buddy will just be to help them find their way around, make sure they are okay. Each person also has a supervisor as their direct point of contact. There is an induction profile that all managers get, that they have to go through with their member of staff. It is recommended they do this on the first day, this on the first week, and then they have to send those back by a certain date to HR who record the activities have taken place. There is a 12 week review with the member of staff, and a review at 26 weeks, because there is a 6 month probation period.

Socialising is encouraged in the organisation. A1 provides one example, *'Last night, something the principal likes to do, we had a beach party. The weather was terrible, but there was fish and chips laid on, and Pimms when you arrived, and there were two buses laid on to help people come to it. It is becoming more difficult to do things like that as we get bigger. That village feel is being lost to some extent, as you can't possibly know everybody as we get bigger'*. There is also a refectory on-site which is open to staff and students, but there is not a separate staff room. There are benches around the gardens, so in the summer people will sit there. A new coffee bar and seating area are currently under construction.

Location-based working is encouraged and staff are accommodated to work from home. Laptops are available for people to take home although most people come in to the office, in general it depends on the job. People are able to check emails etc. from home but the culture of the organisation discourages this. As A1 states *'nothing here is life or death. If anything really needed to be done, I would get it done. But most things can wait till Monday'* while A3 highlights *'There was a time that I'd go on holiday and take the phone and the Blackberry, and my wife would kill me. Now I just go. We're very fortunate in this kind of escalation process of triage, if staff are unavailable the department still runs. They know the nuts and bolts; we have a help desk that will tackle day to day things, and escalate them'*. A2 also comments on working from home opportunities, *'I check emails at home, but only to a point. I am quite good at working out what I need to do to get ahead of myself, or to help the managers get ahead of themselves, so that we are prepared for the next stage. If I feel that, to make my day better tomorrow or to make my week better next week, I should check my emails or type up some notes or do something in the evening, then I will do it. Generally, I can easily walk out and not think about work until the next day. Sometimes you make that personal decision to say, 'this is my time to challenge myself, to show what I can do, to not sit around and say I haven't got time to do it'. For me, that has been my personal challenge.'*

The research team asked how staff would promote a good idea within the organisation. A1 outlined that *'With the new pay scale, we have introduced an 'exceptionality' award, particularly if people can't go any higher in their increments. They don't have to be at the highest level, but it helps. After we make the round of staff appraisals, we then make a case for people that we consider have performed exceptionally. So if your brilliant idea saved us time we might put you*

*forward for an award at the panel that the principal chairs. That's a one-off payment, unless you get it twice in a row, in which case it gets consolidated into your salary. But that can cause problems too, where people see something as a team effort, but only one person gets recognised; or you are encouraging individual performance. I don't think people work harder or smarter because of the award, I think they do it because that is the way they are, or they are going through a phase where they want to advance themselves. We see this as an opportunity to recognise this. And it is published when people get awards, so they have to be prepared to be in the public eye, to recognise the pat on the back. There is also the opportunity to pass an idea up the hierarchy via your team lead'.*

Internal and external networking are encouraged by Organisation A. As A2 states, *'Because of the sounding board aspect of the job, I have had to rely on internal networks to get a good grasp of the role and how things work around here, currently and historically'*. A4 declares that Organisation A is very focused on external networks, *'External networking, absolutely, we couldn't manage without that. Perhaps it was one of my criticisms of this organisation when I joined, that not enough eyes were focused externally. If you don't get outside, you'll never develop and learn'*.

Tacit knowledge, key within Organisation A, is aided by personal relationships as mentioned by A2, *'I think if I left tomorrow, my job is very much around communication and relationship building, that sort of thing. If someone wants to find out about a policy, we have policies; if someone wants to find out about a case I have made case notes. On a very basic knowledge level, that is there; but you lose those relationships and that trust that is built up, there is a level of confidence that you build up over the years, and that would suddenly vanish. The new post holder would have to start all over again. We try really hard here with relationship building. When anyone comes in we are really friendly'*. A1 comments on capturing tacit knowledge, *'If someone key left we would survive, but it would be awkward. For example, we have someone in Registry who does student returns. He has been there forever, and knows everything about fee funding. If he were to go we would be really stuck. He is planning to retire in about three years, so we really need to get everything out of him before he goes. Obviously he has a font of knowledge . . . People working with him in the past might not have understood all that he was doing; now they are quizzing him to learn from him. He is open enough to that, and as it gets closer to time for him to retire he might be more inclined to share his knowledge. He does understand why it is so important to us to try and do a 'brain dump' before he leaves. But we are never going to replace him with someone who has worked for us for 35 years, who knows all the history, all the recent precedent . . . we just can't. And that's fine. We will replace him with someone who knows the system and has the ability to learn'*. He goes on to outline that process knowledge is also critical knowledge that must be captured in some form, *'It is partly about encouraging the documentation of what he does'*.

Opportunity for progression within Company A can be limited, a point highlighted by A2, *'You are sitting waiting for the person above you to leave, really, or for the restructure. That's just another opportunity. Sometimes, roles are*

*re-evaluated. Roles get bigger, more responsible*'. However, A3 mentions that lack of progression appeals to some people, *'In some respects, you have just described someone next door perfectly: don't want responsibility; I like what I'm doing; I've been given jobs and I like doing them; I'm a bit of a geek and I don't really like people. It's all of those ... there are strengths and weaknesses'*.

In terms of training Organisation A offers opportunities for people to develop their careers with professional development, taking advantage of both internal and external training. Training opportunities for staff are identified through the appraisal system. There is also a provision if people find things throughout the year that they might want to go to. Not many requests for training are turned down. A2 states the organisation *'makes quite a big thing about training, even before people come here. When they come here we talk about how good our staff development is, because there is that recognition that there are not a huge amount of career development opportunities, so that is seen as a bit of a carrot'*. Secondments are also encouraged for staff development.

Company A does not have any formal accreditation, such as EFQM or Investors in People (IIP), to promote their undertakings as they would rather spend the money on investing in people rather than getting the kite-mark. There may come a point in the future where that will be a valuable thing to do. A4 has the view *'Kite-marks can be very useful, in terms of showing off to the outside world, encouraging applicants who are interested in that, but you can be driven by the kite-mark rather than what's the right thing to do. I have no problem with them, but I'm not signed up to them being the be-all and end-all'*.

Summarising people orientated activity within Organisation A, A4 outlines the reasons why he joined the organisation and has found it so rewarding, *'I had always found it the friendliest, the nicest atmosphere, it has a pretty campus: it was a really nice environment and I was pleased to come here. This is exactly the kind of job that I thought I would do some day. It's about making a difference, and since I have worked out what my career trajectory was, I thought that what I want to do is use the skills I have to make the most difference that I can; so I want to keep being promoted or to do new things, to the point where I feel that that is as much difference as I can make. So if I do have the opportunity to do a bigger job with more influence, then that's really nice, because I can influence more things for what I think is the good. This job offered that. What I didn't realise at the time, until I was here and in post, was that it offers much more than what it says on the tin, because apart from the fact that you can write an information strategy or chair the equalities committee, etc., you manage to get involved in everything. Because we are small, and because of the role I have, you can get involved in whatever I want, within reason. A lot of the time you have the chance genuinely to shape how things go. I hadn't realised how significant that would be. I know I would find it very difficult now to look at a job that closed down some of those opportunities. You get used to the fact that you genuinely have a voice that cuts across almost whatever you want it to – not about academic delivery, but in terms of how the institution is operating, there is a chance for all of us to become involved'*.

Tapping into the ‘knowing’, then capturing and sharing this knowledge, is driving Organisation A towards a bright future where people, technology and information are interlinked.

**Case 2: Organisation B, Public Health Department**

Organisation B was established in Northern Ireland on 1 April 2005, merging a role that was formerly performed by four local health boards to regulate independent and public sector health provisions, such as hospitals, children’s homes, nursing homes, and residential homes. The remit of the organisation is expanding to cover services such as domiciliary care, day care centres, etc. so the actual physical staff resources of the company are growing. Organisation B is based over two locations, with around 10 staff in the smaller location and around 120 people based in headquarters. In addition, they have a pool of bank staff that may be brought in from time to time if a particular situation arises where they are short of full time staff. However, being conscious of Value for Money (VFM) on public expenditure, Organisation B aim to keep external appointments to a minimum.

Although Organisation B is funded by the DHSSPS they are considered to be a non-departmental public body so are independent up to a point. However they are a highly regulated organisation. As B1 outlines, *‘there is a range of legislative requirements that we have to adhere to, there are a number of statues and orders. We must carry those out to the letter of the law. They take in all kinds of things . . . there is a whole raft of criteria. If an establishment fails in one of these legislative requirements, ultimately we have recourse to law and that is used, but only in a very limited number of occasions. We prefer to work in partnership with our stakeholders and that generally is the way it is. The independent sector has to be properly policed and there is obviously a slight temptation to cut corners so we look out for that’*. Inspections are carried out twice a year in most establishments; one is announced, one is unannounced. There are also specialist inspections, pharmacy inspections and financial inspections.

Organisation B has quite a large board (12 members). The Senior Executive team is formed of the Medical Director, Director of Operations, Director of Corporate Services, and Director of Quality Assurance. There are a number of operational teams led by heads of programme. Organisation B has a sister company based in Edinburgh, Scotland.

Five interviews were conducted within this organisation, as shown below:

Overview of interviewees coding	Role
B1	IT Management
B2	Data Management
B3	HR Management
B4	Records Management
B5	Information Management

### Macro-environment

Organisation B tend to look to their sister company and other external networks for guidance. As B1 states, *'I suppose they have been established longer than ourselves, so certainly there are close links between them and ourselves and yes, we want to adopt best practice wherever we find it. One of the aims for networking is to ensure a lot of time and money is not spent reinventing what is already available. As Organisation B has become more confident in its operations they feel they adding value and 'not just somebody who's always asking. Hopefully we're making some sort of contribution to the overall picture' (B1).*

The current economic climate is having an effect on Organisation B; however this is to a limited degree as a public authority they have always been conscious of expenditure and use of public funds. B1 finds that *'increasingly we are looking at all our spend: VFM [value for money], we must at all times demonstrate that what we do spend is value for money. We are trying to work smarter and cheaper'.*

### Organisation Climate

Although Organisation B is a relatively new organisation they have a long history. B1 felt that it has been a challenge merging the original four branches into one new organisation, *'to bring together four totally separate groups, all working to the same common registration but interpreting things in their own way. There were tremendous change management issues there in terms of getting common systems up working, even the fact that every office has their own work culture as you can imagine. It's taken us a while to get to where we are. Now we are really starting to move'.* Organisation B are based over two locations (referred to as HQ and location b), one of the challenges is ensuring coherent working practices between the two. They have connected both offices with IT networking which is proving to be beneficial, as outlined by B1, *'we have moved things on tentatively with direct access into our systems but there are other areas of communication improvement we are trying to bring into place. We are investigating videoconferencing at the minute. We are looking at other ways we can use technology: 20 % of our staff are using Blackberry technology. Maybe location is geographically isolated but we are trying to minimise that. And again the operational teams span the two offices, so if there is a team meeting, generally they will come down to HQ. So we are trying to minimise the traffic between the two offices and we are getting there'.*

As Organisation B are moving towards a more coherent internal approach, they have just developed a new corporate strategy based on Value Creation Maps, a methodology developed by Bernard Marr. While they reviewed a number of methodologies, they selected the Value Mapping approach as it goes beyond the Balanced Scorecard, and is attractive as it allows visual representation of the strategy, on one page, as B3 declares, *'For the public or other stakeholders, it is an instant take. With one page you can walk them through the strategy without going beyond the map . . . the tool has been brilliant. Where it requires a bit more work is in terms of the KPIs. From my perspective that was the most problematic aspect of the project. Some of our KPIs are more reports'.* Organisation B are not

aware of the exact number of KPIs but they have quite a few, which is challenging for the company.

On the back of the Value Creation Map, Organisation B has approved a new strategy, in developing the strategy they have involved staff as much as possible, and other key stakeholders, via written communications, team meetings and in workshops specifically focused on developing the strategy and the performance measurement framework that goes with the strategy. As the company intends individual objectives to come from the strategy and the business plan, so objectives cascade down, and in return individuals should be able to see their contribution to the overall delivery of the strategy for the organisation. Based on the strategy they have also created a mission statement. In the Value Creation Map there is a value proposition and four core activities that are the 'must-dos' for the organisation. There is a hierarchy within the Value Creation Map, so value propositions are defined first, then core activities, then value drivers, and then the supporting resources. It is a top-down, bottom-up model. The core activities are the key things as to how the value proposition is delivered, which is how to deliver value and add value to stakeholders. Interviewee B4 outlines how staff are responding to the Value Creation Map, *'that is now in the new corporate strategy, so everyone is getting to grips with something that looks quite fancy, but is really just looking at your own particular area and asking what each value driver means for you. You can see where you want to go, what is expected of you'*. A copy of the strategic plan is available on a shared folder that all staff can access. The ethos in Company B is to promote business improvement as part and parcel of every manager's role to drive the organisation towards future quality assurance awards such as EFQM, ISO and IIP.

Organisation B has an open plan working environment, which is positively accepted by staff, even though negative aspects exist, as outlined by B3, *'There are benefits with the open plan, the main one being communication. There are disadvantages. Particularly as director, you are completely accessible. When you are trying to work on something, people will come up to your desk. If you are trying to write a report, or to focus on something, it can be very difficult because there are noises off, or there is a meeting taking place a few yards away from you'*.

One of the positive aspects identified with having an open plan environment is the ability for teams to work closely. As B1 declares, *'I think there is a fair bit of working between teams. I mean, just the fact we are open plan – essentially it is a tremendous bonus in terms of office communication. We are a small organisation, so I don't think we can afford to work in little side roles. There is a lot of cross working'*. In agreement, B2 states, *'sitting close to the team works really well. First of all, it breaks down the barriers. I hope the guys can approach me – I am not that stranger in another building. We get a lot of synergy. When we get phone calls I can shout across to the relevant member of staff to find out the issue. If someone is on the phone to one of them giving them a hard time, I can tell them not to worry about it ... I'm like that too with others: if I want an answer, I'll get an answer. I think that contributes to an extremely fast paced environment. I haven't seen any organisation as powerful as [B] where the Chief Executive actually sits on the*

*same floor as everyone else'. She concludes by declaring, 'It is enjoyable to work here. There are good things here. In a normal place, the directors have their own photocopier, so if our photocopier breaks nobody really cares. Here, the director has to queue, and if it is broken, he doesn't get his copies'.*

However, the fast-paced growth of the organisation has had an impact on the management of teams. B5 declares, *'Just personally speaking, because I've now been asked to be responsible for so much, it's very difficult to keep up with how much the team is producing. To find time to even sit down and talk to them about what they mean by that bit of the policy, how will that impact and to go through it all and have a session about it, it's very difficult. I certainly feel it in terms of how much I'm responsible for, and I almost feel guilty because I can't touch base with them as much as I used to. Having said that I still feel what we are doing is sufficient and they are great at keeping me up to scratch and letting me know what's going on. I think that the bigger an organisation gets, the more difficult that gets. The advantage here is I still think there is a small group atmosphere. Sometimes isn't great either because you have a little clique-y thing going on. I think it happens no matter what size you are. It happens everywhere. People come together in little groups and other people get excluded.'*

### **Technology**

Organisation B outsource their IT, but also have an ICT Delivery Manager employed to oversee IT development. They claim outsourcing works well, though they do have the option to take IT control back in-house if they wanted. The decision to employ an ICT Delivery Manager was based on the growing needs of the company, as B1 declares, *'As we expand in numbers, as our role expands, we are very heavily dependent on ICT. Most of our inspectors now would have ICT access to email and our systems from their homes, employing 3G technology, Blackberries and we are really pushing the boundaries of technology. We felt we needed somebody who could pretty much concentrate just on that one area'.* While Organisation B employ a number of software applications, they do so in standard ways, as B1 highlighted, *'these days Microsoft Office is just about the only show in town, I honestly can't think of anybody in the past two years who has come in and said, "look I've never used Office before"'. We will always make training available if people have any difficulty with a package. Though we use technology a lot, we are using it in fairly simplistic ways. I'm not aware of staff who are having any difficulty with ICT'.* Information storage is also portrayed on a fairly low level (shared folders is the most common route) though the company outlines their wish to use the Intranet more: *'We have what we call our file store. There is space on our server where all our information is stored. There's a whole series of permissions and hierarchies in terms of who can access what. But we want to formalise it more via a proper intranet. I suppose in a way we have certain common shared areas where we do store information, so I suppose it's a very simplistic shared intranet area. We want to have a proper intranet'.*

Being in an open plan environment B1 feels there is still too much reliance on email as a communication method, *'I think sometimes people use emails too much.*



*You receive emails literally from people who are within touching distance over things that are not worth it to go into print about. I think in general there is a reasonable balance between casual informal communication and slightly more formal. We are always being asked to archive people's accounts. We tend to get a lot of stuff with large attachments. We are encouraging people to deal with the issue, take the attachment and put it wherever it should be, in a folder or file. We are very reliant on email. It uses a lot of space on the server'. One of the reasons for this reliance on email is for accountability; people tend to store email so they have a record of events that have occurred. This policy may change in the near future when the new ICT manager introduces a formal policy on use of ICT, including email.*

One area for future investigation is the use of Business Intelligence (BI) tools, however securing funding for a complex suite seems to be a pipedream. As B2 outlines, *'We are a reasonably small organisation, so data drill down can be done manually, it's a bit more tedious, but at the end of the day the information is there. The form is almost cosmetic. If there are issues, they can approach us. But they [staff] can also run the reports themselves that give them the detailed information, so they can have a look themselves. At the same time, I have assisted people, telling them what it means. It would be great if we have everything, but looking at our budget and what a good system costs, given the complexities of the organisation we would need really good friends in the department to get that money'*. B3 also comments on the funding issue stating, *'If we had a few million more, we could incorporate BI'*. In concluding the technology section, B5 outlines that the technological spectrum is healthy and that people should be aware and appreciate the resources at their disposal.

## **Information**

Organisation B has established an information team with emphasis on service improvement and regulation. The need for an information team is outlined by B5, *'Previous to that, I think they had an information person, but in the main they were just working on some discrete databases and that. This was a move to bring a corporate strategic approach to information management and then to link up other areas like records, the management of the analytical side, the databases and then get all those to relate. We wanted to actually incorporate that into the business flow. The policies and procedures that we are developing will determine how the system works, and then the knowledge management will all be there in terms of what information is generated; on what basis; how often; who is it reported to; who is responsible for it; what are the definitions; what are the KPIs. All of that will stem but it has been a slow process. We have been a year at it now, and our remit seems to get ever increasing, but it's a long road ahead of us. We have a lot to do. I feel we are relatively embryonic, at the beginnings of things'*. As Organisation B is a regulatory body, by law they must maintain an accurate, up-to-date register on establishments they monitor, containing details such as address details, what type of establishment it is, what the user groups are, manager details, and the proprietor. As B3 outlines *'All of these things have to be approved by us, so it is not just a database. You cannot just change the address, for example, because if the address*

*changes, obviously the building has changed, and we will have to approve the building again. It is a huge management process as opposed to just holding information. At the moment, we have an Access database, which has some limitations'.*

One such limitation is scalability, as B3 declares, *'At the end of the day, it is about scalability. Although it is small, it has to work in the bigger picture as well. Working with a huge amount of data forces you to be very methodological'.* Information is provided openly to for all interested parties to view, *'every Friday they get a browse-able version to look at . . .but everyone can look at everything. The registry is public, so anyone can request information . . . There is a free flow of information'.* Organisation B are finding this information flow beneficial as they are now receiving information from their clients faster, as B3 outlines about a recent information call, *'It is a culture change. We actually received a 97% return rate which is quite impressive for 1200 establishments. But to get there took quite a bit and we had to just harass them until they did it. We just had to be persistent. It is more that if they do not reply, they will hear from us again. We do not go away'.* Fulfilling information requests from staff is challenging, as B3 declares, *'If you have ever worked in information people tell you what they want, and when you ask them it turns out it is not really what they want. I have learned to query why they want it, so I can suggest what I think they really want'* while B4 states, *'The project teams will know how they want information to look, and will ask if we can facilitate it'.* Lack of information requirements has resulted in poor system development, *'They developed the current system themselves. It has now come to us, and it is full of problems. We would not have done it that way. It is too late now to change it, so we have to go with it, to piece a broken egg back together. We just have to tweak it and make it work as best we can. We are not magicians'.*

Information resources are outlined to new employees during the induction process. The team manager outlines the level of access the person is entitled to (read write, read only) and that will be communicated at team level. If someone is unable to access a folder they can request authorisation which is generally granted in a few hours.

## **People**

Staff in Organisation B tend to be recruited from similar professional backgrounds as B1 outlines, *'A lot of them come in as former social workers or nurses or from professional backgrounds, say pharmacists. I would say for most of our staff recruitment now, it would be pretty unusual if they weren't a graduate. A lot of our secretarial staff are graduates. They see a career path, and quite a number of our staff have actually managed to be promoted, either internally or externally'.* Other staff also commented on the organisation being an attractive employer. This is evident in quotations such as, *'We are seen as a good organisation to join and the perception is that we are growing numerically. I'm not aware of any difficulties in recruiting staff'* and *'So I think we're seen as an organisation which places staff development as a very important feature of recruitment and retention'.* The

retention factor is also evident through the low staff turnover. B1 claims they have only lost two members of staff in recent years, one of whom transferred to location b.

Organisation B employs flexible working arrangements depending on the level of employee (based on the public sector banding structure). There is also the option for location based working though many staff don't actually have official working contracts yet, but this is something B1 outlines will be happening in the future, *'I think ultimately we will have some form of home work contract. It makes financial sense because we're not far off bursting at the seams here spacewise. My feeling is that there will be a reasonable uptake but obviously we have to manage that and look at business needs, business requirements and how that model of staffing provision fits the operational side of the organisation. It's happening elsewhere and I don't see why it shouldn't work here'*. B3 also outlines home-working is something the company are considering, *'We don't have a formal home working policy in place. That is something we are going to develop this year. If there is a particular justification, then there is no problem about working from home. You do tend to be more productive'*. B3 outlines that the provision of location-based working is something that needs to be carefully managed, claiming *'My view would be that that sort of arrangement would need to be carefully managed. At the end of the day, it is not about where you are, it is about deliverables. If you are working from home because you are working on a report, when you come back into the office the work should be complete, so that it is demonstrable what you have done, and why you have been working from home'*.

Organisation B is keen to encourage ideas from staff, which can be fed up to Senior Management through their line manager, *'I would say that this organisation is very receptive to that form of feedback. There are a lot of innovations and developments going on. I don't think it would be perceived by any member of staff as a static organisation. I think those ideas would be welcomed on any front, and we would run with good ideas that people would have' (B1)*. In terms of recognition for new ideas, B3 outlines the process, *'Certainly, you would hope they would be praised at team meetings if they have come up with a good idea. There would also be the opportunity, in terms of recognition, to present at team meetings, not only within the individual's team meeting but also at the wider team meetings, staff are given the opportunity in those different fora to step forward and get recognition for their work'*. Being a public sector organisation no financial reward would be given, B3 comments on lack of financial incentive, *'There is no chance of a bonus. This is the public sector. There is no bonus, no reward. But we have a good manager, and she will say we did well, and give us credit in exec meetings. Sometime I think that is as good as anything. It is nice to get feedback that things were done right, and that they are working well'*. A similar view was expressed in terms of lack of promotion.

Company B try to capture employee knowledge if someone is leaving the organisation. As B3 states, *'In terms of staff who have left before, within corporate services, they have been asked to document as much as possible. Obviously, their emails, documents and files are all archived off. There would also be an exit*

*interview to walk through everything they have been working on, so if it has not been possible to have a handover to the new member of staff, at least their manager will know what they had been working on and how far they have gotten on with that. There are not other mechanisms in place to capture what was in someone's head'. B4 also mentioned lack of tacit knowledge capture: 'that is all kept in my head. You tend to know these things yourself, through experience; there is no mechanism in place for me to record my lessons learned or thoughts ... It is not documented anywhere'. In saying that, Organisation B was unable to identify any cases where information gaps were detected when someone had left the company, 'I'm not aware of any situation where there was an awful gasp and panic because someone had moved somewhere else. But we can always improve' (B2).*

Organisation B operates family friendly working practices such as term-time working, career breaks, and secondments, even though take up on these are minimum. Holidays are linked to service, from 22 to 33 days depending on your length of service. After 10 years you will have 33 days. That is quite a benefit which every member of staff is entitled to. Socialising is encouraged through events such as the Christmas party. Teams within the company also tend to socialise together occasionally. When asked what the best things about working for Organisation B were one employee declared, *'Firstly, the pay packet: I have a mortgage to pay. Secondly, challenge on a personal basis. It is difficult to get to grips with. There is a lot more expectation than I encountered in previous positions. It was a steep learning curve, and there was no other in-house expertise, so there was no-one I could turn to for help if I was having a bit of trouble. I had to go to someone in another organisation and he was very helpful. Thirdly, you are facing challenges daily, wondering how you can take them forward, and using trial and error to make them work. I talk to people outside; I liaise with internal staff, to find out the bigger picture. Finally, the people I work with, the team I am based in is great, with a really supportive manager'.*

Organisation B has been through a major culture change in the past few years, where strategy, communication and standardisation have been outlined as key challenges. The research team observed that Organisation B seemed to be strong in people and information elements but weak in technology, to which B5 responded, *'It is the bit that hinders us the most, but I don't want to take a step of securing a piece of technology and it being wrong. So as difficult as it is with the technology the way it is – we make the best use of it that we possibly can, so we are making the best of what we've got but with a view that there are technologies there that we can use to improve'.* Asked if the term Knowledge Management was used in the organisation, B5 responded, *'I wouldn't say the term knowledge management; we refer mostly to information management, the term information means everything here. I suppose we're still investigating what we could potentially do in terms of KM implementation'.*

### **Case 3: Organisation C, Waste Management**

Organisation C is a waste management service within a local authority in Northern Ireland. It has approximately 250 staff, split between site staff based at a number of

locations, several tens of collection squads and an office-based team. Each year, up to six students join the service from local universities or under the EU Leonardo programme from other Member States.

Six interviews were conducted within this organisation, as shown:

Overview of interviewees coding	Role
C1	Head of Service
C2	Business Support Manager
C3	Waste Operations Manager
C4	Waste Collections Manager
C5	Management Information Officer
C6	Projects Officer

**Macro-environment**

Triggered by best value, the local authority has been introducing a programme of modernisation over the past decade which has incorporated performance management and improving the efficiency of service delivery. As one of the largest authorities in Northern Ireland, there was widespread recognition of the importance to regularising management systems and standardising how services are delivered to residents throughout this transition. There is also an understanding that this programme of modernisation is accelerating, and that further fundamental changes are inevitable as a result of Government’s programme of austerity and redrafting of local council boundaries which is coming into effect in 2015. There is an increasing appreciation of the need to update management practices and that ICT has a significant role to play in this context.

Against this backdrop, the waste management service has implemented a major programme of work to divert waste from landfill, avoid financial penalty and to meet the annually increasing recycling targets associated with EU waste legislation. As reported by McAdam and Walker (2003) local authorities’ waste services have not used frameworks to structure change or deliver the corporate agendas as outlined above, but have primarily focused upon the technical imperatives of meeting these targets. This singularity of focus has meant that while they are high-profile universal services, their attention has been upon improving service delivery/achieving target and they have not contributed much to the corporate direction of travel of their organisations.

In this instance, the waste management service has been progressive in adopting different management approaches to assist in meeting the targets. The Excellence Model was used initially and, combined recently with some knowledge management approaches, it has (i) improved awareness of operational issues facing these services within councils (ii) encouraged greater sectoral sharing (iii) better disseminated best practice and (iv) helped offset the “*silos*” created by a simple operational focus brought about by the threat of fines for non-target performance. The service is aware that, being part of a larger local authority than many of its peers in Northern Ireland, it faces issues which detrimentally impact upon

meeting the targets and for which there are no other local comparators locally for how to address these. Consequently, its “*performance*” appears to lag behind many of its neighbours despite the considerable investment in terms of resources and skills which have been made to date.

The local authority has managed to keep the rate of inflation down to minimise the impact of the credit crunch on both residents and businesses and, most recently, the local politicians agreed a zero rate increase for 2013/2014. This rate is likely to continue for the foreseeable future which means that, in addition to the efficiencies achieved over the past 5 years, there are likely to be more fundamental changes to the organisational structure and manner in which services are delivered in order to continue to provide services.

### **Organisational Culture**

The waste management service has played a significant role in developing a partnership with its neighbouring local authorities to establish a common agenda and to develop new waste infrastructure to meet the EU and national waste targets. This has meant working in close collaboration with these authorities’ waste services to produce a Waste Plan which identified what technological mix was needed and was appropriate given the nature of wastes in the region, the political perspectives prevailing in the authorities, the timescale available to procure these facilities and the various requirements and contributions from the different authorities within the partnership. This has required, and continues to need, a considerable input to steer this project towards a successful conclusion.

In addition to this supra-council role, the senior management team of the waste management service has worked hard locally to establish a professional atmosphere within the local authority with all staff understanding the aims and objectives of the service and why achieving target is a key priority. To help achieve this, information is shared regularly

- Between the senior management team to focus upon strategic and operational issues
- Between the operational managers to ensure that there is a clear understanding of what’s expected and to facilitate a two-way flow of information and ideas back from the front-line
- Through a number of task-and-finish working groups to consider and resolve specific issues (e.g. how to tailor individual services for the hundreds of apartment blocks in the area, how to embed health and safety into daily operations)
- With all team members through quarterly service-wide meetings and
- Between the trade union and key senior managers

The result of this degree of engagement has been to create a transparent organisation culture which is reinforced by the open-door policy that the senior managers use. “*It makes for an easy working environment where the team feel empowered to deliver on their work and, should there be any difficulties or problems, they can revert to their manager or one of the other senior staff to get guidance or help work out the best course of action*” stated C1.

As the service is clearly focused upon the EU legislative targets, there is a common language amongst the team (acronyms and all) which has been captured and established as a norm through the development and maintenance of an integrated management system. Running in conjunction with the corporate systems which track significant themes such as financial management and budgetary control, risk, procurement and contract management, and programme management, the service has built upon the early work on the Excellence Model to implement a framework which incorporates ISO 9001 (quality management), ISO 14001 (environmental management) and OHSAS 18001 (health and safety management). This has been developed, and is regularly updated, in both hard and soft copy. Both these formats are available at the different locations within the local authority area and continue to be used because (a) many staff are more familiar with paperwork and folder storage and (b) it makes it easier for site inspections when the regulators visit. This approach has worked well with few observations recorded to date. The resultant series of procedures and approaches, which have been and continue to be refreshed on an ongoing basis over the past decade, are independently audited each year and further reviewed and refined in light of comments received. This integrated system therefore is in a constant state of evolution and is applied uniformly throughout the service and forms the backbone for service delivery.

As the key aim of the service is to achieve legal compliance with EU and national legislation, this means that considerable emphasis is placed on ensuring that the legal register is maintained and that all team members are aware of what contribution they are making to this objective. One of the challenges for the waste management service however has been to ensure that the scale and scope of what it is seeking to achieve is recognised corporately and represented within its planning programme: to date, there have been mixed results.

The local authority recognised that its performance management system was outdated and in need of review to ensure that a common system was adopted council-wide. In this regard, it considered the various management approaches which were being applied in the public sector and, after considering how a balanced scorecard could be developed, it started work with Bernard Marr to develop a new corporate strategy based upon value mapping and the development of a Value Creation Map (VCM).

The new VCM worked on the basis of cascading the corporate priorities throughout the local authority, with each subsequent management tier developing its own, more detailed version. The aim was to create a pyramidal flow of actions and responsibility to deliver the priorities. Measuring performance against these corporate objectives was to be achieved by use of a small number of focused performance indicators (PIs). The aim was to better link planning, budgeting and performance under one corporate VCM, supported by 17 aligned service VCMs and 112 corporate PIs. There should be between 10 and 15 service-based PIs per service which were then carried through to individual manager's personal development plans.

The importance of ensuring legal compliance arising for waste management was recognised as a priority and captured within this new corporate performance management system. One underplayed issue within this new VCM was the variable degrees of risk inherent in delivering the Waste Plan in an immature marketplace as

Northern Ireland's industry base is predominantly SME (many of the commercial organisations in the sector are in the early stages of development). This has meant that considerable effort has had to be spent by the waste management team to plug gaps which have arisen in the delivery of this Plan arising from

- Termination/delays in procurement arising from, for example, legal challenge,
- Acquisition/demerger activity between local/national companies and the generally immature state of the waste management industry in Northern Ireland,
- Changes in Government legislation and policy, and
- The need to target specific waste streams to ensure that the legislative target compliance could be achieved.

This has led to on the one hand, clearer articulation of what the waste management service will do against this variable backcloth while, on the other hand, corporate managers have been reserved in engaging with the service due to the perceived complexity, uncertainty and difficulty in delivering projects.

The strong organisation culture in Company C has tended to stress the priority of target compliance which has provided a clear focus for the waste management service. Also, given the corporate focus in preparing for the reform of local government which will shift the local authorities boundary outwards, introduce a range of new services around place-shaping and regeneration, planning and community planning, housing, local economic development and tourism and while not commensurately increasing its budget and staffing levels, this has meant the corporate managers have other priorities to focus upon. The result is that, while there was a window for waste management to make a greater contribution to the corporate agenda, with the focus now on meeting target, maintaining the existing frameworks and doing more for less, the emphasis has remained upon service delivery within the technical confines of the service.

### **Technology**

Organisation C has a dedicated service which has been instrumental in developing and implementing a corporate approach to information and communication technology council-wide. This has flowed from the type of packages which are used corporately (SAP) through to specialist systems which support particular needs of the different services (FLARE). The local authority is using standard Microsoft work packages for daily transactions and to support both internet and intranet. A corporate programme was in place until relatively recently to ensure that all computers over 5 years old were replaced on a rolling basis. The senior officers are all expected to be available on blackberries for mobile phone, text and email purposes.

It has recently been recognised though that, in this period of credit crunch, the authority cannot continue to maintain and service such a disparate collection of needs around the different systems (there are over 100 in operation council-wide) and, much as occurred with the corporate strategy a decade ago, a process of standardisation and simplification is underway. This is further driven by the need to prepare for local government reform which will introduce additional needs and



expectations from the new services joining which may also be using different standards and systems which will need to be aligned.

In terms of the waste management service, over the past 10 years it has been working with the authorities' ICT service and an external contractor to develop and refine a package which permits the recyclates presented by residents to be recorded when being collected (i.e. it allows for the service to gauge the level at which different areas of the city are recycling). Each recycling bin has a chip which is assigned to a house and records when it is lifted by one of the local authorities' refuse collection vehicles. The resultant "heat" maps which are produced by mapping the results within the council boundary are then used to target the service's door-knocking resources to engage with residents and to address any concerns and to encourage them to take part. These team members have mobile phones to allow them to communicate with the office and tablets to allow them to engage directly and competently with residents by providing pictures of recyclates, access to Council policy and show pictures of what happens to the materials post-collection.

Further technology is used to manage the residual waste and recyclables at (a) the kerbside (b) the Household Recycling Centres and (c) the Waste Transfer Station. These are in the form of a fleet of refuse collection vehicles of various sizes, smaller pick-up transit-type vans, a number of static and mobile compactors, and several loading shovels for loading articulated lorries. These vehicles are used on a daily basis. Weighbridges are used at a number of the sites to weigh vehicles on/off site and the provide data through recording tonnages and tracking performance against target.

### **Information**

As the corporate priority for the waste management service is to ensure annual target compliance on an ongoing basis, considerable emphasis has been placed on the gathering and analysis of data over the past decade. During this time, many new actions have been introduced, both at partnership level as well as within the council itself, to improve the overall recycling performance. As a result, the recycling rate has risen from around 4 % to just over 40 % presently.

As per most areas of professional and personal life, in terms of managing the firehose of information which has started to flow ever more freely, there are times when officers working in the waste services sector feel swamped. There is also a challenge to balance and analyse the new data generated or the technical information arising from benchmark services and from within the sector at large. New approaches and systems are being used to assist in this endeavour.

In order to track local authorities' performance both individually and collectively in order to determine if the UK will comply with EC legislation, Government introduced a management information system, called WasteDataFlow, to ensure that progress towards delivering EU legislative compliance could be tracked and into which every UK council inputs data on the performance of their recycling and composting arrangements. This dataset permits Government to determine which local authorities are performing well, and which are not. It also allows different local authorities the same facility and, following analysis of the data and the resultant information, has facilitated benchmarking:

- On an ad hoc basis,
- On a historical one,
- As a “*best in class*” exercise and
- Against nearest/similar neighbour

Drawing from this information pool, local authorities have been able to see what appears to have worked and to develop appropriate similar services for their own areas. In terms of the local partnership in Northern Ireland, and regarding managing the residual waste procurement exercise, a complex spreadsheet has been developed which allows for the outcome of the different recycling initiatives to be captured and manipulated to determine what approaches might yield the best results in improving recycling yield for individual local authorities, and how this may impact upon the overall residual waste left needing treatment. As there are several local authorities within the partnership, all with slightly different arrangements in place, considerable resources are needed on an occasional basis to ensure that the information within the spreadsheet is maintained, is up-to-date and to consider what the implications arising from certain actions are both (a) for the individual council and (b) for the overall partnership. Typically, questions are raised, such as:

- What information do we have?
- Can we make sense of it?
- Is it useable?
- Can we present this information in an easy to understand way?

To augment the high-level work done by the partnership in tracking outcome and predicting performance, as covered earlier, the data from the bin chips is used to produce “*heat*” maps which show which areas have been participating and to what level. This ensures that the local authority can target its squad of door-knockers to focus upon areas where participation rates are lower in order to encourage greater engagement and continue to deliver an improving recycling rate for the area. Shared folders have been created into which these monthly updated maps are stored, and different members of the team are able to access them from their workstations to inform their projects and target their efforts.

The local authority has also adopted a corporate performance measurement system, called Corvu, to assist the Corporate Management Team (CMT) in managing performance across the whole organisation. This is a widely used automated system which has been rolled-out to help embed a performance culture. It was chosen as it allows for a single performance system with standardised reporting to be in place council-wide and is easy and intuitive to use. The framework being used set a quarterly reporting schedule to CMT at which departmental and corporate reports are considered. At the next tier, the departments regularly review performance by PIs and consider the (re-)allocation of resources in order to improve service delivery or target particular issues. The local authority’s recycling performance is monitored and reported upon within this framework.

Organisation C is also looking to bring together multiple different information sources so that they can be better shared; it is doing this under a CityStats banner.

This allows for the growing demand for small area statistics to be presented at different geographies (e.g. ward level, electoral areas, quadrants, &c). There are a number of services which are eager to access this data, community safety and parks and leisure through to waste management and economic development. Typically, these services are looking for statistics and data around the socioeconomic situations prevailing in an area (e.g. unemployment figures, number of businesses, disability & health data, crime), data for consultations (what do residents want for their area?), what the investment plans are for an area.

When finalised, CityStats will allow the gathering and retrieval of information by theme on an intranet website and aid in the focus of regenerating the city. It is expected that this single point contact for all the spatial information within the council will allow better mining of the data and, as is being heralded by waste management, permit more in the way of geographical “heat” maps to diagrammatically present datasets from a wide variety of council systems, map statistics at a small area level, impose data quality standards, improve local area analysis and reporting, and to publish information in a different manner of ways.

## People

Organisation C operates standard local authority terms and conditions, for example, access to overtime, time off in lieu, statutory maternity/paternity leave. Work hours for the staff within the waste management service vary depending upon their operational role; in this regard the office is staffed from 08.00 to 18.00 Mon-Fri but those working on the Household Recycling Centres work a 7-day a week shift pattern which varies between summer and winter. The Waste Transfer Station team work from 07.00 to 16.00 Mon-Sat while the refuse collection squads work from 06.30 to 15.30 Mon-Fri. There is limited scope for flexible working practices as many of the roles are dictated by the requirements of the post.

There are a wide range of backgrounds represented within the service, from basic school education through vocational qualifications and post-graduate degrees. There is no one qualification or skills set which predominates which makes for an interesting and ever-evolving discussion around waste and resources management. There is a regular cycle of meetings at individual, team and group level which is supplemented by specific meetings to address (a) the integrated management system and (b) ad hoc meetings to consider items such as review of the Waste Plan, development of a new action, quarterly recycling performance and next steps. C1 outlined “*generally, the Service works well and it has consistently risen to the ongoing challenge of meeting the ever-increasing recycling targets. What this means is that immediately after induction new starts tend to very rapidly get assimilated within their respective team. The rate of progress is continual and I’ve given up saying ‘don’t worry, next year it’ll be easier’.* The service has tended to operate as one big family and, truth be told, I feel very paternalistic and protective of them.”

To provide operations on a regular basis, considerable use is made of email and mobile phones, supported by laptop computers and the occasional tablet. The majority of staff are not office based and many staff are constantly mobile and so need to stay in touch using these tools. Knowledge is also captured and shared within the teams using a series of PC-based folders into which are copied (a) operational plans and the service’s Waste Plan, (b) the integrated management

system, (c) the “heat” maps and (d) many of the corporate policies and procedures (i.e. risk assessments). There is an increasing understanding of the importance of documenting and cataloguing the work but, as this is a local authority, in many regards this is merely reinforcing the existing approach – each month reports are taken to Committee outlining developments and proposals which are then discussed and approved by Members. These are later ratified at full Council. Any proposal of scale must follow these steps. Consequently, there is golden cord arising from the development of plans and budgeting, through to the approval and instigation of projects which is well understood within the team.

As the team is well-versed in the issues around waste management, they are also encouraged to take part in the extra-curricular activities in the sector, such as represent the local authority at national conferences, speak at these events when requested, and contribute to the local and national professional bodies where appropriate. This has meant that staff within the waste management service are recognised as being professional and hard-working by their peers. C1 reflected this when he said *“for many years, the service and I have introduced a wide range of new services and, through field research (i.e. learning by applying what we’ve seen others do, trying stuff out for ourselves and innovating) we have got a reputation for being progressive and eager to improve. We’ve sought to share this ‘enthusiasm’ for waste and resources with everyone in the Service and have supported them take a proactive role outside work, in their communities, hobbies and professionally, whenever feasible.”* Overall, Organisation C appreciates challenging times ahead, looking to KM to aid organisation development and sustainability.

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## 5 Discussion

A significant portion of the research concerning the UK public sector’s use of management approaches and how it responded to change was focused upon best value and performance management but, increasingly, the positive role that can be gained from using a KM perspective is being clearly articulated. Application of KM should lead to a well-designed and managed change programme, responsive to environmental changes external to the organisation. Aspects for public sector development include sustainability, cost reduction and efficiencies, conservatism, ability to work smarter, and innovation.

To date, however, KM has not been explicitly referenced nor the KM tools badged clearly as contributing to this agenda. Therefore, the benefit of using KM is not being seen as a control mechanism to help structure change and deliver improvement in service delivery, despite these aspects being an increasing unavoidable aspect of Government’s response to the credit crunch. Despite this, strong KM which seeks to embed information, technology, people and processes into an organisation’s culture is becoming the norm, as shown by the case studies and, in the process, it is contributing to the transformation of services and driving improvements in performance.

Within public sector organisations conflict exists regarding external pressures, reflected on internal organisation climate (OC). On one hand, OC is viewed as

positive, expressed in flexible working practices, employee loyalty, low staff turnover, etc. while on the other, it is viewed as static and stale, stifling creativity and innovation. While one staff member may describe OC as *'interesting'* another refers to it as *'cynical'*. One way to reduce such varied approaches is via company strategy/mission statement. Communication has been identified as a key issue to develop positive organisational climate, as has the need for transparency within organisations and for public value for money.

Embedding technical climate into public sector organisations is challenging. While strong technical climate/infrastructure is key for promoting and supporting KM, issues surrounding scalability, information storage and communication tend to exist, a challenge for public sector organisations is the provision of robust, integrated systems that can be utilised globally for information storage, share and application.

Technological tools for KM can be classified into three categories, namely, intelligent tools, support tools and web-based tools. For KM to be successful organisations must select tools which are not only familiar to the employees but of use. The KM arena has suffered in recent years with the re-branding of traditional tools (such as office automation systems) as KM systems. Organisations need to look at their information needs, choosing technology systems and applications to further advance the knowledge agenda. In the public sector ICT systems are used for information capture, storage and use, knowledge acquisition, communication and to obtain expertise into and within the organisation. Security of technological systems/tools is a problem which many public sector organisations face. While it is crucial that public information is adequately protected, security can have a detrimental effect on knowledge sharing if it is too controlled.

Other technology challenges include location-based access to systems, single sign-on, better internet access and use in terms of content filtering, searching and semantic labelling, system access to areas that are beyond access boundaries, and reduction of corporate knowledge silos. However on a positive note public sector organisations interviewed found that *'employees are willing to accept new technological implementations if provided with tools that make it easy for them'* (E3) and are willing to *'actually relinquish some of what they perceive as control over the information and at least allow people to see it'* (F2). Technology tools such as Internet and email enhance communication channels while information systems encourage content management, knowledge sharing and information accessibility. Security needs to be high yet flexible to encourage knowledge sharing and technological use.

Information should flow easily around the organisation ensuring that people have access to *'the right knowledge in the right format at the right time'* (Davenport and Prusak 1998). Systems to facilitate the capture and dissemination of information throughout public sector organisations facilitate information capture from both internal and external sources. One element to be considered in ensuring accurate information systems is that of content management. Responsibility must be taken to ensure that information sources are up-to-date and relevant preventing databases and other storage mechanisms from becoming static repositories of obsolete data (Davenport and Prusak 1998). Reflecting on the need for an information strategy

Company E is an example of good practice as they have awarded considerable time and effort to creating an information strategy.

Knowledge-oriented organisations respect employee emancipation and welfare, evidenced by informal interactions and practice (Haas and Hansen 2007). Views on flexible working practices seem to differ within participant organisations. Consistent with the literature (see Davenport and Prusak 1998) much KM work takes place in teams. Senior management tend to lead by example, creating an atmosphere where new employees soon feel settled and ready to participate in flexible work practices. Flexibility is key to helping new staff fit in. Succession planning is one KM initiative most organisations are considering.

People issues are the most stretching for organisations to adopt. Changing individual perspectives, gaining staff buy-in for change, and implementing change consistently across all levels of the organisation is challenging.

## 6 Strategies for KM Implementation

Current KM literature outlines a number of strategic approaches, for example Hansen et al. (1999) consider codification versus personalisation, Robertson (2005) introduces a top-down and bottom-up approach and Choi and Lee (2002) link strategy to the knowledge creation process, to name but a few. With no intention of re-inventing the wheel, this chapter has identified a number of factors for KM implementation strategies, taken from in-depth literature review and empirical research in the form of both quantitative and qualitative investigation. Case research undertaken with three UK public sector organisations identified (via content analysis, Nvivo) a number of key themes for KM implementation, these are displayed in the following word tag (Fig. 3).



Fig. 3 KM strategies tag

## Conclusion

While an increasing number of organisations are realising the benefits of active knowledge management they are also discovering the difficulty of KM implementation (Birkinshaw 2001). Results from an empirical study conducted in early 2009 with 588 UK companies, applying the MeCTIP model and 'Benchmarking KM' online survey tool, provide insight into key elements which organisations must focus on for KM success. Two of these relate to the infrastructure of the organisation in terms of culture and technical infrastructure while three relate to process orientated activity for information, technology application and human expertise.

The effective measurement of KM enables organisations to have a more upstream, predictor focus on business performance (Zack et al. 2009). As the creation of new knowledge and its embodiment within the organisation is likely to lead to new product/service development (Johnston and Clark 2008), the measurement of knowledge activity within the organisation, resulting in increased business intelligence and competitive advantage will facilitate UK companies' sustainability, growth and maturity 'riding the storms' of the current economic climate. It has been reported that Governments recognise that improving national and international effectiveness and competitiveness is based on deploying knowledge management approaches (OECD 2001).

As reported earlier, however, Cong and Pandya's (2003) research highlighted that the public sector was lagging behind, and cross referencing this with the details provided by the cases shows different approaches to implementing knowledge management. The size of the cases shows that, even with smaller organisations, there is still a range of perspectives to be considered when capturing information and then ensuring that this is distributed and available. There is also the unswerving NPM belief in Government that the techniques and approaches employed in the commercial world would be beneficially employed in the public sector. In terms of the current economic climate, this means that while the private sector seems to be rebounding gradually there is a delay in the public sector which is likely to take several years to work through and, without the stimulus of increasing profits, it is not clear how long it will take the public sector to rebase as a result. As the focus of the public sector shifted from performance management to efficiency (Schlafke et al. 2013), this has meant that best value for money is the predominant paradigm prevailing at present, a perspective not likely to change and which, combined with a loss of funding, means that significant structural change is in store.

The cases continue to innovate and improve despite the contradiction that, while knowledge management could be particularly potent in improving the effectiveness of operations, there is an increasingly dark spectre for them of cost savings needing to be realised to demonstrate efficiency. If Government could reflect upon the evidence supplied within the cases, and its approach to knowledge management, an alternative approach to managing the present rebalancing in a more productive and imaginative way could be developed.

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# Supporting Business Managers with Knowledge Management

Kursad Ozlen and Nermina Durmic

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## 1 Introduction

A contingency perspective of knowledge management has gained widespread recognition and popularity in recent literature (Hansen et al. 1999; Snowden 2002; Becerra-Fernandez et al. 2004). Essentially, this view advocates the need for alignment of the knowledge management initiatives (KMI) with the decision tasks, environment and personal preferences of decision makers. The advantage of such a view is seen in an opportunity for seamless integration between knowledge management and business environment (El Sawy 2003).

The contingency viewpoint poses new challenges for researchers and practitioners who need to deal with its theoretical and practical consequences for decision making support. The purpose of this paper is to respond to these challenges by trying to determine which knowledge management initiatives (KMI) represent the most suitable support for which decision making circumstances. In order to identify the right KMI-context fit, an improved understanding is required of the characteristics of different KMI and decision situations and their impact on pre-decisional behavior and performance of decision makers.

KMI are an emerging class of decision aids that target managerial work by focusing on enabling and facilitating creation, sharing, retention and discovery of knowledge needed for decision making. KMI are expected to reduce or eliminate decision biases (Arnott 2002) and improve users' decision making capabilities.

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Various social and technical initiatives are recommended in terms of this support (Handzic 2004, 2007).

Technical or systems-orientated approaches generally describe KMI in terms of various ICT- based systems designed to facilitate the management of knowledge by enhancing the accumulation and transfer of knowledge through the organisation (Sambamurthy and Subramani 2005). In contrast, social or human-orientated approaches to KMI place emphasis on organisational leadership, culture, structure and measurement as key enablers of processes that foster knowledge development (Holsapple 2003). The literature provides considerable theoretical support for suggesting that the potential return from KMI implementations can be enormous if they are properly designed and implemented (Alavi and Leidner 2001).

The literature distinguishes between two main positions on “proper” KMI design and implementation. The universalistic view suggests that there is one single best approach which should be adopted in all circumstances. In contrast, the contingency view suggests that no one approach is best under all circumstances. Collectively, the proponents of the contingency view (Hansen et al. 1999; Snowden 2002; Becerra-Fernandez et al. 2004) suggest a series of knowledge, task, organisation and environment characteristics as influencing factors that may affect the suitability of alternative KMI implementations. However, there is a general lack of empirical evidence to support this proposition.

Therefore, the aim of this study is to fill the existing void and contribute to the improved understanding of the issue of the right KMI-context fit. In particular, the study aims to empirically examine the impact of different KMI approaches on business managers’ decision making behavior and performance in decision contexts of varying complexity. It is expected that the improved understanding of the issue will serve as a foundation for better KMI design and implementation.

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## 2 Literature Review

This study forms a part of a larger research undertaking aimed at investigating KMI adoption and its effectiveness in individual decision making. In the current study, the focus is on two key factors: type of KMI approach (technical vs. social) and complexity of decision context (simple vs. complex) and their role in business managers’ decision support. The following sections provide a brief overview of these concepts.

### 2.1 KMI Approaches

For the purpose of this study, knowledge management initiative is defined as a set of socio-technical enablers and facilitators of knowledge processes that modify and move knowledge stocks and thus foster knowledge development. Literature proposes a wide variety of social and technical mechanisms and initiatives that have the potential to help knowledge flow and grow, and consequently lead to enhanced or innovative performance.

With respect to socially orientated approaches, Handzic (2007) identifies four major classes: culture, leadership, structure and measurement. Organisational culture is recognised as one of the most important factors in enabling a knowledge-conducive environment. Therefore, many social initiatives try to nurture a knowledge culture by promoting espoused values, systems, structures, and artefacts in order to achieve a desired mindset in staff members (Handzic and Agahari 2003). Also, putting in place rewards and incentive systems can motivate knowledge sharing and knowledge contribution (Evangelou and Karacapilidis 2005). According to Hauschild et al. (2001), successful companies reward employees for seeking, sharing, and creating knowledge instead of pushing knowledge down from the top.

Furthermore, literature suggests that successful knowledge management implementation requires strong leadership to guide an organisation towards managing its knowledge resources for maximum benefit (Holsapple 2003). The important characteristics of leaders include strong interpersonal, communication and change management skills, an understanding of the business, technological expertise, and the ability to build relationships. Leaders act as catalysts through inspiring, mentoring, setting examples, listening, and engendering trust and respect. They also influence organisational culture, structure and measurement (Handzic 2011).

With respect to structure, organisations can use a variety of organisational forms to create an environment to support collaboration and knowledge sharing. In general, networked structures (or CoPs), are believed to offer the ability for individuals to work together and encourage open communication and learning based on common interests (Wenger 1998). Bureaucratic structures that emphasise hierarchies and command and control over individuals are believed to discourage creativity and innovation (Lesser and Storck 2001).

There is a widespread agreement in literature that organisations cannot effectively manage knowledge without addressing the measurement issue, and vice versa. The intellectual capital (IC) perspective brings these two together by linking knowledge with strategic business objectives on one side and learning processes on another (Zhou and Fink 2003). Organisations need to know what they know and what they must know to be competitive. Measurement initiatives provide metrics and feedback to management. The outcome of such a measurement exercise is expected to be a more effective knowledge management approach.

Technical KMI involve a variety of information and communication technologies and software applications. Handzic (2004) distinguishes four main classes of ICT-based KMI depending on their knowledge enabling function. These include knowledge retention, sharing, discovery and generation systems. Knowledge retention systems facilitate capturing and storage, as well as subsequent access to recorded knowledge. Knowledge sharing systems facilitate transfer of knowledge through interaction and collaboration among people. Knowledge discovery systems enable the finding of hidden patterns in data, their interpretation and prediction. Finally, knowledge generation systems support creativity and research that enable new knowledge development. These four classes of systems jointly support processes of exploitation and exploration of explicit and tacit knowledge.

Each of the above four classes of KMI can be implemented with a wide range of specific technologies (Alavi and Leidner 2001) and commercial KM software available on the market (Tsui 2003). Thus, knowledge retention systems may involve various storage and retrieval technologies and business intelligence systems including databases, data warehouses, data marts etc. Knowledge sharing systems may use a variety of communication and collaboration technologies including emails, forums, audio and video conferencing, social networks etc. Knowledge discovery systems may rely on different data and text mining technologies, business analytics tools, visualization etc. Finally, knowledge generation systems may incorporate a selection of simulation games, online tutorials, virtual experiments etc.

The review of KM frameworks (Heisig 2009) identified these technical initiatives as critical factors of KM success in more than 50 % of the frameworks. A number of other investigations reported KMI system and/or service quality as determinants of KMI adoption and success (Liu et al. 2005; Xu and Quaddus 2005). Two most recent empirical studies linked technical KMI sophistication to improved performance (Salleh et al. 2010) and revealed that the effectiveness of decision making was influenced by the availability of required technologies (Mohsen et al. 2011).

In summary, the reviewed knowledge management concepts and models, as well as prior empirical research suggest that both social and technical initiatives may have positive influence on decision makers' pre-decisional knowledge processes and thus may aid individual decision making. However, from the contingency perspective, different approaches may have different value in different decision making tasks. It is claimed that the benefits expected from adopting social KMI are greater if the task is complex rather than simple. The opposite claim is made regarding the value of technical KMI. The objective of the current study is to examine the issue empirically.

## 2.2 Decision Contexts

In general, the term "context" denotes "the circumstances that form the setting for an event" (<http://dictionary.com>). Scholars have suggested a variety of informational, operational, organizational, environmental, historical, attentional, behavioral and causal aspects that comprise the decision makers' context (Salleh et al. 2010). They have also suggested that the context model should include only contextual elements relevant to satisfy the decision maker's needs. For the purpose of modeling a decision context, some investigators (Wood 1986; Campbell 1988) have taken into account three elements: decision task, decision environment and decision maker. Jointly, the characteristics of these three elements determine the level of decision context complexity.

With respect to decision task, literature evaluates complexity in terms of the objective properties of the task and the subjective reaction of the individual. Among objective complexity properties, Wood (1986) has introduced component,

coordinative and dynamic dimensions of the task. These refer to a number of cues or acts, form and strength of their relationships and change over time. On the other hand, Campbell (1988) has proposed task complexity as a primary psychological experience that may be evoked for reasons other than task, such as anxiety and fear.

Investigators have also identified a number of environmental factors that contribute to context complexity. Some of these include time and money constraints, significance, irreversibility and accountability. In general, constraints are recognized as stressors, while others may be related to important status or financial consequences for the decision maker or client. In addition, literature identifies personal knowledge, ability and motivation as those individual characteristics that make the decision situation more or less complex. With knowledge and ability comes an opinion about appropriateness of a strategy and likelihood of application.

From the perspective of complexity theory, the difficulty of the decision situation is expected to increase with the objective and/or perceived complexity due to decision task, environment and/or decision maker. This, in turn, is expected to affect individual decision behavior and subsequent decision performance. The behavioral decision theory proposes a positive relationship between the level of decision context complexity and the level of analytical complexity of decision making strategy.

In knowledge management, Snowden (2002) also uses complexity theory as a basis to differentiate between known, complicated, complex and chaotic knowledge domains that determine KM strategies. In addition to knowledge characteristics (explicit/tacit, declarative/procedural), Becerra-Fernandez et al. (2004) suggest a number of other contingency factors that contribute to context complexity and influence knowledge processes. These include task uncertainty and interdependence, organization size, business strategy and environmental uncertainty. In general, the notion of “perceived” complexity allows description and comparative analyses of decision contexts across companies, sectors, markets, products, activities and people.

In summary, the above review suggests that perceived complexity of a typical prevailing decision situation faced by a business manager may be an important factor in determining the right KMI approach for supporting his or her decision making. However, different studies make different claims regarding the role of context in KMI impacts. The contingency view proposes that resolving complex situations requires greater reliance on people, while simple situations can be handled easier with technology. The current study proposes to examine the issue empirically.

### 2.3 Research Model and Objectives

Drawing from insights from knowledge management and decision making literature, the following research model is proposed and presented in Fig. 1. The model depicts four interrelated variables: (i) KMI approach, (ii) decision context, (iii) KMI adoption and (iv) decision performance.



**Fig. 1** Proposed research model

KMI approach is defined in terms of an organisation's dominant orientation towards technical or social mechanisms and practices in initiatives design. Decision context is conceptualized as a set of task, environment and person attributes that characterise the overall complexity of the typical decision situation faced by a business manager. KMI adoption is reflected in the degree of the manager's KMI usage in knowledge processing. Decision performance is regarded as the ultimate outcome of knowledge management support for decision making.

The model further proposes several plausible relationships between model variables. More specifically, it posits that KMI approach and decision context jointly influence a decision maker's adoption of KMI and through the person's KMI usage in knowledge processes impact his or her decision performance. However, from the contingency perspective, KMI approach is assumed to have a differential impact on KMI adoption behaviour and thus decision performance dependent upon the decision context. The current study tested these assumptions empirically.

### 3 Research Methodology

A field study was conducted among business managers from 22 Turkey-based organisations that were purposely selected by the researchers due to their knowledge intensive character and implementation of KMI. Out of 372 responses received, 73 were excluded from further consideration due to missing data. The analyses were performed with the remaining 299 useful responses. The study focused on individual levels of analysis, taking as sample units decision makers (respondent business managers) who needed to assess whether or not to adopt a KMI to support their decision making.

A survey form was designed to capture the participants' perceptions of the complexity of their typical decision context, their opinions about their organisation's KMI, as well as to self-report the extent of their KMI usage in pre-decisional knowledge processes and their perceived subsequent decision performance. All relevant items used to measure the variables included in the research model are provided in the list available in the Appendix. In replying to the



questionnaire, the respondents rated their agreement with each given statement relative to negative and positive end-points of a 7-point Likert scale.

Two independent variables, KMI approach and decision context, were evaluated in the following way. KMI approach was classified as dominant technical KMI or social KMI, based on a ratio of the mean score on items of organisational leadership, structure, culture & measurement and the mean score on items for organisational business intelligence, business analytics, communication & collaboration, creativity & e-learning initiatives. Values below 0.5 denoted dominant technical KMI and values above 0.5 denoted prevalent social KMI. There were no undecided cases. Decision context was measured by an average rating score for decision task, decision environment and decision maker items. Values below 3 (out of 7) denoted simple context, while values between 3 and 5 denoted complex context (although only moderately). There were no scores higher than 5, therefore no cases of extreme complexity.

Two dependent variables were KMI adoption and decision performance. KMI adoption was evaluated in terms of the extent of KMI usage in acquiring and sharing existing knowledge, as well as generating and discovering new knowledge. The variable was measured by an average rating score of these four process items. Decision performance was evaluated in terms of perceived decision quality, confidence and satisfaction operationalised by respective items rating scores. Decision performance was considered the ultimate indicator of KMI value for decision support.

All the collected and calculated responses were encoded, entered into a computer and were combined into one file. The participants were grouped by KMI approach (technical or social) and decision context (simple or complex) based on their scores. Then, their behavioral and performance responses were analyzed using SPSS statistical package. The results are reported in the next section.

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## 4 Results

Descriptive results (means & standard deviations) for KMI adoption and decision performance variables by KMI approach and decision context are presented in Table 1. Results of further analysis of the collected data by ANOVA are reported in Table 2. The analysis found some significant results.

### 4.1 KMI Adoption

The study tested whether there would be any difference in decision makers' KMI adoption for knowledge processes due to different KMI approach, regardless of their decision contexts. The results in Table 2 indicate that KMI approach had no overall impact on KMI adoption in knowledge processes. The main effect of KMI on process scores was not significant ( $F = 2.407$ ,  $p = 0.122$ ). However, there was a

**Table 1** Descriptive statistics for dependent variables by KMI and context

Dependent variable	KMI approach	Decision context	Mean	Std. dev.	N
KMI adoption	Technical KMI	Simple context	4.5705	1.44180	39
		Complex context	4.9966	1.12692	73
		Total	4.8482	1.25578	112
	Social KMI	Simple context	5.1288	1.31430	66
		Complex context	4.9332	1.27711	121
		Total	5.0022	1.29024	187
	Total	Simple context	4.9214	1.38298	105
		Complex context	4.9571	1.22017	194
		Total	4.9445	1.27751	299
Decision performance	Technical KMI	Simple context	5.6072	1.21118	39
		Complex context	5.2611	1.25997	73
		Total	5.3816	1.24875	112
	Social KMI	Simple context	5.9595	0.95098	66
		Complex context	5.5816	1.00334	121
		Total	5.7150	0.99916	187
	Total	Simple context	5.8287	1.06325	105
		Complex context	5.4610	1.11462	194
		Total	5.5901	1.10909	299

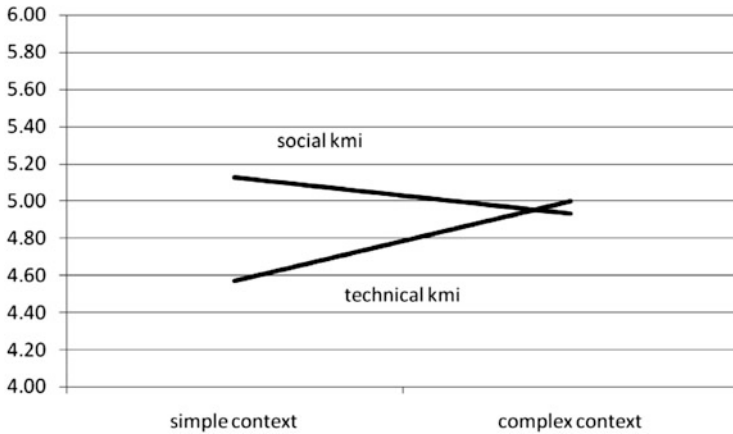
**Table 2** Summary results of ANOVA tests of between-subjects effects

Source	Dependent variable	df	Mean square	F	Sig.
KMI approach (KA)	KMI adoption	1	3.903	2.407	0.122
	Decision performance	1	7.214	6.087	0.014**
Decision context (DC)	KMI adoption	1	0.847	0.522	0.471
	Decision performance	1	8.354	7.049	0.008***
KA * DC	KMI adoption	1	6.158	3.797	0.052*
	Decision performance	1	0.016	0.014	0.907
Error	KMI adoption	295	1.622		
	Decision performance	295	1.185		
Total	KMI adoption	299			
	Decision performance	299			

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

significant interaction effect between KMI approach and decision context ( $F = 3.797$ ,  $p = 0.052$ ). This interaction effect is presented graphically in Fig. 2.

The follow-up analyses by context showed that KMI significantly influenced KMI adoption in knowledge processes in simple, but not in complex decision contexts. In simple contexts, the subjects self-reported less extensive use of KMI in knowledge processing when enabled by technical than by social KMI (4.57 vs. 5.13,  $t = -1.980$ ,  $p = 0.051$ ). In complex contexts, they self-reported similarly extensive use of KMI in knowledge processes irrespective of KMI approach (5.00 vs. 4.93,  $t = 0.361$ ,  $p = 0.719$ ).



**Fig. 2** KMI approach effects on KMI adoption by decision contexts

These results are contrary to the expected greater reliance on technical KMI in simple and on social KMI in complex decision contexts. However, the fact that all mean scores were greater than 4 (out of 7) indicates that both approaches to KMI were fairly useful in supporting subjects' pre-decisional knowledge processes.

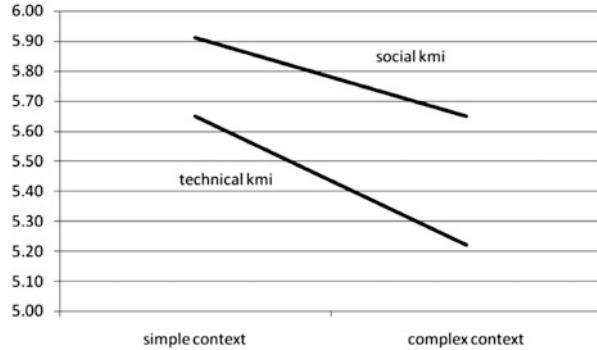
## 4.2 Decision Performance

The study also examined whether there would be any difference in subjects' decision performance due to different KMI approach irrespective of their decision contexts. The analysis found that KMI had a significant overall impact on decision performance. Table 2 shows a highly significant main effect of KMI on performance scores ( $F = 6.087$ ,  $p = 0.014$ ). However, further analysis by contexts revealed that the effect was significant only in complex decision contexts, but not in simple decision contexts.

In simple decision contexts, the subjects self-reported similar levels of decision performance irrespective of KMI approach (5.61 vs. 5.96,  $t = -1.555$ ,  $p = 0.125$ ). In complex contexts, they reported significantly lower levels of performance with technical KMI than with social KMI (5.26 vs. 5.58,  $t = -1.848$ ,  $p = 0.067$ ).

Mean decision performance scores for two KMI approaches by decision contexts are presented graphically in Fig. 3. The figure shows that all scores were above 5 (out of 7). This meant that subjects performed quite well irrespective of KMI approach and decision context. Less than perfect scores indicate room for further improvement.

**Fig. 3** KMI approach effects on decision performance by decision contexts



## 5 Discussion

### 5.1 Main Findings

The main findings of this study provide partial support for the contingency view of KM. The contingency perspective proposes that the impact of KMI approach (social or technical) on business managers' decision making is dependent upon the nature of their typical decision context (simple or complex). In summary, the proposition is supported when decision making was evaluated in terms of KMI adoption in pre-decisional knowledge processes in simple decision contexts (but not complex), and decision performance in complex decision contexts (but not simple).

More specifically, the study has demonstrated that social KMI inspired greater degree of reliance and usage in learning effort than technical KMI in simple contexts. This was evidenced in higher mean scores of KMI adoption in knowledge processes found among social than technical KMI subjects. However, when faced with complex situations, subjects tended to rely heavily on whatever dominant KMI approach was implemented in their organisation for supporting their pre-decisional knowledge processing. This is visible in comparable mean KMI adoption scores for complex decision context subjects' irrespective of KMI approach.

The nature of subjects' behavior revealed in the study is contrary to expectations. In general, literature advocates the use of technology-based codification strategies as more suitable than people-orientated personalization strategies in circumstances characterised by ordered task domains where patterns are known or knowable and can be easily reused or analyzed with technology (Hansen et al. 1999; Snowden 2002). However, this study found evidence of the opposite behavior. The current study does not offer any plausible explanation for this finding. One can only speculate that the potential reason may be in national culture or geographical proximity of the participating subjects.

With respect to decision performance, the study revealed that the type of adopted KMI approach made no difference to performance in simple contexts. This was

demonstrated by comparable mean performance scores between subjects supported by social and technical KMI. In contrast, decision performance in complex contexts was highly dependent upon the type of adopted KMI approach, with social KMI being more effective than technical ones in enhancing performance. This was evidenced by significantly higher mean scores of decision performance found among social than technical KMI subjects.

The explanation for the discovery made for complex decision contexts can be found in the contingency perspective (Khalifa et al. 2008). Such a finding is in full accordance with the suggested increasing importance of the human factor and diminishing value of technology in unordered decision domains with more uncertain or novel problems. The fact that the adoption of social KMI did not translate to significant improvement in performance in simple contexts means that savings can be made by implementing technical KMI as a less costly solution for reuse of known or analysis of knowable domains and without any loss of performance (Hansen et al. 1999; Snowden 2002). However, the final choice of the most suitable KMI approach for simple contexts may require a cost/benefit analysis of economic factors and decision makers' preferences.

## 5.2 Implications, Limitations and Future Research

Knowledge of the factors that influence the adoption and effectiveness of KMI in decision making have important implications for research. Because KMIs support and extend decision making capability, a thorough understanding of the underlying processes is required to provide constructive guidance for the design and implementation of such initiatives. To this end, the current study contributes empirical evidence of partial support for the contingency view of KM, by identifying the moderating effect of decision context in the adoption and effectiveness of KMI in simple and complex situations respectively.

The findings also have some important implications for practical implementations of KMI in organisations. Performance-wise, this study revealed clear advantage of social over technical KMI initiatives for supporting decision making in difficult, novel situations with significant consequences. This should be sufficient justification for managers to implement strategies that emphasise knowledge leadership, network structures, learning cultures and continued measurement and feedback.

When it comes to decision making in simple, routine and familiar situations, managers have a choice between two equally effective strategies: social as described above, or technical, involving various information and communication technologies that facilitate knowledge accumulation and transfer. When individual pre-decisional behaviors are taken into account, social initiatives were clearly preferred by respondents over technical ones, as they inspired more learning activities. This implies that managers should consider giving higher priority to social than technical initiatives in order to satisfy decision makers' preferences.

Nevertheless, cost and geography related considerations may change management priorities in favor of technical KMI.

The above findings and recommendations need to be interpreted and considered with care due to a number of study limitations. Firstly, the study examined only cases with a dominant (rather than a balanced) social and technical approach to KMI. Next, the lack of true experimental design, unequal groups, subjective measures and parametric statistical tests may limit the validity of the study findings. In addition, exhibited preferences and behaviors of participants from the collectivistic Turkish culture (Hofstede 2013) may not generalize to other geographical and cultural settings.

Therefore, further studies need to be carried out to address the above limitations and establish validity and generalisability of the current findings. Furthermore, the instrument to assess context is not well documented in literature. In future, criteria other than complexity applied in this study may be used to classify different contexts. Finally, the current study focused on the individual behavior and performance. Future research needs to extend the present investigation to collective issues at group, organisation, industry, region or global level.

## Conclusions

The findings of this study make a significant contribution to KM (and DSS) research by providing important empirical support for the context contingent impact of KMI on business managers' decision making. More specifically, the study establishes that social KMI are more effective than technical KMI for aiding complex decision making situations. The opposite is true for simple decision making situations. Although less favored by subjects, technical KMI appear more appropriate for aiding simpler decision making, given the same performance impact as social KMI (but at a lower cost and global reach).

These findings imply that organisations that implement technical rather than social KMI will generate less manager engagement in learning activities, but may expect equal individual performance in simpler, known or knowable decision circumstances. In other, more complex, unknown or chaotic decision circumstances, organisations do require socially orientated approaches to enable superior performance of their management staff.

Given the limited nature of current findings there is a need for further investigation with an aim of enriching the collective understanding of KM phenomena. Several possible directions are suggested for future research that would replicate and extend current investigation to other contexts, subjects, initiatives and measures in order to verify and generalise these findings. Future research is also recommended to address the open questions regarding the concept of context, as well as to broaden the investigation from individuals to collectives.

## Appendix: List of Research Variables and Measures

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### Decision context

#### *Decision task*

- Most decision problems that I solve are complicated/complex
- In my organisation, I encounter a lot of problems with uncertain/changing causal links
- In my organisation, many of my decision tasks are rather ambiguous/unclear
- My decision problems are often novel/unfamiliar/unknown to me

#### *Decision environment*

- I have limited time & money to spend on making my decisions
- My decisions have significant personal & organisational consequences
- I am solely accountable for all my decisions
- Most of my decisions are irreversible and can not be easily corrected

#### *Decision maker*

- I have the necessary knowledge and skills to perform my decision tasks
- I am able to solve decision problems that I encounter
- My motivation to do well is high
- I learn quickly from experience

### KMI approach

#### *Technical KMI*

- In my organisation, KMI has sophisticated business intelligence components
- My organisation's KMI incorporates intelligent business analytics tools
- KMI in my organisation comprises excellent systems for communication & collaboration
- In my organisation, KMI includes advanced e-learning and creativity support features

#### *Social KMI*

- Leadership of my organisation is visionary
- My organisation is organised as a network structure/form
- In my organisation, there is knowledge-friendly culture
- My organisation has developed a knowledge measurement system

### KMI adoption

#### *I use/rely on KMI to*

- Access captured internal/external knowledge and gather intelligence
- Uncover and interpret hidden patterns in data and extract new knowledge
- Exchange ideas and share knowledge with my colleagues and experts
- Close gaps in my own knowledge and look for new innovative ideas

### Decision performance

#### *Due to my use/reliance on KMI*

- I am more confident in the quality of my decisions
  - I am more satisfied with the process/outcome of my decision making
  - My efficiency/effectiveness of decision making has improved
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# Understanding and Improving the Professional Toolbox: Communities of Practice as a Paradigmatic Lesson for Knowledge Management

Ettore Bolisani and Enrico Scarso

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## 1 Introduction

The state of maturity of a discipline can be assessed by reflecting on the stability, robustness, and wide acceptance of its notions and concepts. The formulation of ambiguous definitions, the lack of sufficient consensus on them, the use of variations and alternative notions, the overlapping with apparently similar concepts are all issues that can make it difficult to formulate theories, conduct empirical studies, compare findings. In terms of practice, all this can result in naïve applications, inconsistent approaches to problems, incomparable results. The progress itself of the discipline can be at risk.

This condition has characterised, at some point of their history, even disciplines or branches that are now considered to be established. Is the recently emerged discipline of Knowledge Management (KM) (Serenko and Bontis 2013a) suffering from the same problem? If this is the case, what lessons can be drawn, for research and practice? In this chapter, we address these questions by retracing the story of a key concept in KM, that of Community of Practice (CoP).

Introduced by Lave and Wenger (1991) as a part of a broader conceptual framework for reflecting about social learning, CoPs gained popularity and found an extensive use in several areas (Wenger 2010). Some scholars (e.g., Saint-Onge and Wallace 2003; Su et al. 2012) affirm that KM is the elective field of study of CoPs. More precisely, CoPs are regarded as a key component of the so-called human-oriented approach to KM (Newell et al. 2006; Huysman and Wulf 2006). This approach, that considers knowledge as inseparable from the mind of individuals and constructed through joint experience in social networks, suggests that the practical solutions to KM problems reside in organisational settings that help human beings to interact, share meanings, learn from one another, build

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collective knowledge, etc. This leads to a KM personalization strategy (Hansen et al. 1999) that focuses on tacit knowledge and its transfer among people, and consists of promoting direct relations between individuals to enable knowledge sharing.

CoPs are integral part of this strategy, as they are employed to establish favourable conditions for mutual cooperation, social learning, and knowledge transfer. Although their practical implementations don't neglect the technological support of ICT systems, they are mainly seen as facilitators of human interactions.

Extensive research has been conducted on CoPs, not only in the domain of KM but also in the managerial and organisational field. This concept has found practical applications in companies of various sectors (e.g., Shell, ENI, ChevronTexaco, Allianz, DaimlerCrysler, Ford, Caterpillar, Ernst&Young, Accenture, IBM, and HP, just to mention some of the best known) where they have been used as a way to promote knowledge sharing among employees and to improve business performance. This growing popularity has, however, brought about a number of theoretical and applicative issues.

This chapter analyses the evolution of the concept of CoP in KM and the related implications. In particular, it aims:

- To illustrate how the notion of CoP has changed over time and that there is no unambiguous nor agreed definition; both research and practice still suffer from the lack of an established reference; CoPs are seen in different ways, and by means of different notions;
- To show how this has led to a proliferation of different organisational configurations that are tagged as CoPs; the practical manifestations of a CoP in the real life and the way this notion has been used by company executives are often different;
- To discuss how this is also an opportunity for setting a new agenda for KM; there is the need to reflect on definitions and attributes, to formulate theories about CoP formation and management, and to discuss proper methods for application and empirical research;
- Finally, to show how the case of CoP provides useful lessons for KM in general; in particular, both researchers and practitioners should reflect on how the lack of consistency and robustness in concepts and notions can hinder the progress of KM as both a scientific discipline and a professional practice.

The chapter is structured as follows. The second section traces origins and evolution of the concept of CoP, starting from the seminal contributions by Wenger and colleagues, whose studies have strongly influenced the development of this field. In the same section, the importance that CoPs have assumed in the management literature is examined. The third section illustrates the central place that CoPs have in KM research and practice, and section four summarises the findings of a systematic review of the papers on CoPs published in leading KM journals, whose results have been presented in a recent study (Bolisani and Scarso 2014). In section five, hot issues and emerging trends as well as the potential implications for future

research are discussed. The last section illustrates the lessons that, more generally, can be drawn for KM as a discipline.

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## 2 Lifecycle of a Notion: From Wenger's Intuitions to a Great Popularity

### 2.1 The Origins

To understand the actual role of CoPs and their potential future in KM, it is important to examine when the notion was introduced, and how it has evolved over time. First of all, it should be noticed that practical manifestations of what is now called CoP can be traced back to centuries ago. In this regard, Wenger and Snyder (2000, p. 140) underline that *"communities of practice were common as far back as ancient times. In classical Greece, for instance, "corporations" of metalworkers, potters, masons, and other craftsmen had both a social purpose (members worshiped the same deities and celebrated holidays together) and a business function (members trained apprentices and spread innovations). In the Middle Ages, guilds played similar roles for artisans throughout Europe"*. So, the existence of CoPs is reported well before the arising of the idea itself of KM.

Even the modern notion of CoP has its roots outside KM, and precisely in the concept of *learning organizations* (Wenger 1996; Li et al. 2009a) developed by Senge. In Senge's view (1990, p. 3), learning organizations are *"...organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together"*. Learning is seen not merely as an individual process, but it influences and is influenced by the web of relationships and social connections where each person acts; this gives a sort of "collective meaning" to the individual experience.

According to Wenger, who is unanimously considered the "father" of the notion, a CoP can be viewed as *"the simplest social unit that has the characteristics of a social learning system"* (Wenger 2010, p. 179). Early origins of the term can be found in a book about "situated learning" (Lave and Wenger 1991) in which CoPs are seen as an "activity system" where participating people share understandings about what they are doing and what that means for their lives and communities. In short, in the authors' view, a CoP is a set of dynamic relations among people, among activities, and with the external world. This first conceptualisation of CoPs can be well depicted by making use of some keywords, as summarised below.

*Learning:* CoPs are considered as basic building blocks of a *social learning system*, namely a system where learning and knowledge creation occur through socialisation (Wenger 2010).

*Participation:* learning is not merely an individual process but rather the production of social context because the people engage directly in activities, conversations and personal commitment in social life. Individual and collective learning take

place in parallel and are strictly connected to one another. Also, CoPs are seen in strict relation with the notion of “legitimate peripheral participation”: the newcomers or, more generally, the members that are distant from the “core group” must be legitimately involved in the community.

*Identity*: participating in a community and sharing visions with other “colleagues” eventually influence the perceptions and behaviours of CoP’s participants. Inside a CoP, meanings and knowledge are negotiated with respect to the cognitive domain of the community itself.

*Practice*: people engage in a CoP not merely for leisure or “philosophical reasons” but for specific practical purposes. By exploiting the experience of others, CoPs are deemed to help problem-solving and responsiveness not only for the single individuals, who can obtain enriched learning and are stimulated to apply what they learn, but also for the community as a whole (Lesser and Storck 2001).

*Mutual engagement and joint enterprise*: members build “the community” and “the practice” by conducting practice-related interactions with each other on a regular basis; they collectively negotiate what their community is about, and keep each other accountable to this (Wenger 1998).

*Knowledge*: individual and collective learning processes imply and require to share knowledge between participants, to build agreement and consensus over meanings and perceptions, to systematize knowledge and experience, and to develop a collective or “organisational memory” for the benefit of current and future members.

This last point is especially crucial for the purposes of this chapter: although Wenger and colleagues are generally not included among “KM scholars”, they have influenced KM extensively. In particular, the concept of CoP is used in the KM field to reflect on the way knowledge is created and on how it flows inside a group of people.

Wenger and his colleagues have the particular merit of having made an important step towards a definition of CoPs as recognizable organisational structures. After their works, it became possible not only to detect the existence of “structures like CoPs” in the real life, but also to reflect on the proper ways to build CoPs intentionally. Nevertheless, a thorough analysis of Wenger and colleagues’ works highlights how difficult is to provide an unequivocal definition of this concept and to delineate its characters in an appropriate and unquestionable manner.

Despite their indisputable efforts, an unambiguous notion is still missing. Moreover, the notion itself has changed over time. As said, it was originally used to indicate a group of people participating in a system of activities where participants share common understandings of what they are doing and what that means in their lives and for their communities (Lave and Wenger 1991).

This definition has substantially sociological grounds, while the idea of a CoP as a peculiar “organisational arrangement” for targeted business purposes (a view that became popular in the management literature and especially in KM) emerged later when Wenger et al. (2002) proposed that CoPs can be an organisational tool that companies use to manage “knowledge workers” effectively (Li et al. 2009a). So,

while they previously regarded CoPs as a spontaneous phenomenon, later they argued that organisations can design and cultivate these organisational structures explicitly, to enhance their competitiveness.

The evolution of Wenger's thought does not stop here. In a recent work where he examines the "career of the concept" (Wenger 2010) he partially retraces his steps and leaves a "practical" view of CoPs: his focus is no longer on CoP management, but rather on CoPs as a way to reflect on how learning processes occur in a social dimension. In the same paper, Wenger affirms that the great popularity of the notion has had the positive effect of drawing attention to concepts like self-governance, voluntary participation, personal meaning, identity, boundary crossing, peer-to-peer connection, that are at the basis of knowledge and learning but have often been underestimated in organisational studies. However, as he regretfully admits, the co-optation of the notion by practitioners working in different fields has caused a loss of analytical sharpness of the concept, since it has been adopted and used in ways that are not always consistent with the original definition.

Indeed, the literature provides several other definitions of CoP that show similarities but also differences from those of Wenger (Cox 2005; Murillo 2011). In this regard, Duguid (2008), in the prologue of a book summarising the reflections made during a workshop on CoPs, underlines that the understanding of the notion given by the various participants were so many that probably they have not been talking about quite the same thing.

For example, Brown and Duguid's (1991) idea of community of practice is that of a structure typically embedded in a specific organisational context, i.e. large organisations; also, they prefer an egalitarian view of members, while Lave and Wenger (1991) tend to distinguish between categories of members (i.e., central vs. peripheral, or masters vs. apprentices). An additional dimension is that of location: Coakes and Clarke (2006) define CoPs as groups of individuals which may not be co-located but, instead, distributed in different places, which further leads to the additional idea of "virtual CoPs", i.e. CoPs where members don't interact directly but with the massive use of ICT systems. Amin and Roberts (2008), in a review of over 300 publications about CoPs, noticed that the notion was used in very different manners, in relation to the task and purpose of CoP and, consequently, of the kind of knowledge that communities are expected to treat. All this signals the difficulty of framing the different instances of substantially the same phenomenon in a single conceptual scheme to the point that after more than 20 years from the introduction of the concept, the question of *CoP identification* remains unresolved. When can a particular organisational structure be called CoP? Is there any specific characteristic that distinguishes CoPs from other organisational configurations? Of course, this is strictly associated with the issue of definition: in fact, a well-defined notion can guide the detection of CoP existence in real life cases.

The restless efforts to suggest identification criteria derive from the definitional problems previously mentioned. For example, Wenger (1998) proposed even no less than 14 indicators for detecting the existence of a community in a social environment. Later, in Wenger et al. (2002), the authors feel the necessity to further

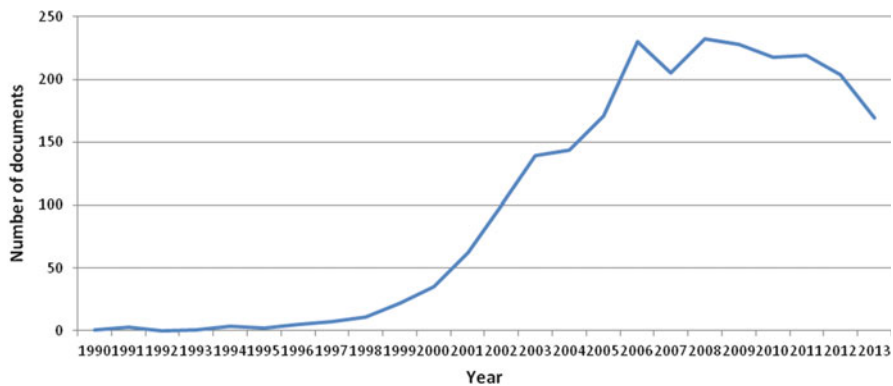
specify the main elements that should characterise CoPs to distinguish them from other organisational settings in a business context, or to discriminate between a CoP and another. Ultimately, the ambiguity of the notion, and the relevant difficulty of specifying identification criteria, is reflected in the variety of its application fields and practical uses, which is, at the same time, the main ground of its great attractiveness.

## 2.2 The Popularity of the Notion in Management

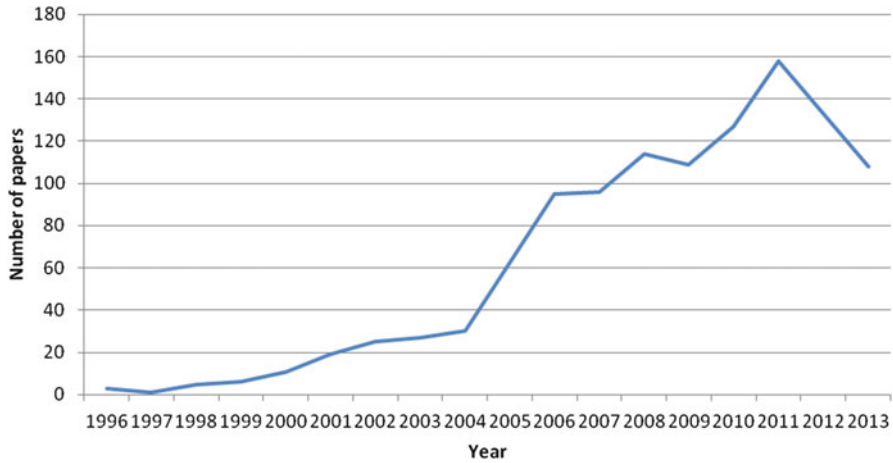
The difficult process of conceptualisation of CoPs has not prevented them from gaining popularity very quickly both in the academic community and among practitioners. Wenger himself (2010) affirms that when the term was coined its “brilliant” career couldn’t have been predicted. A quick lookup into popular sources of academic literature gives an idea of this success. In this regard, the results of a search done (on December 13th, 2013) in Google Scholar and Scopus are presented in this section.

The reader must be warned that these two sources have different characteristics, which explains some differences in the results. Google Scholar is a research engine that gives a quick reference to scholarly literature. It covers a wide range of materials, but it offers a limited number of analytical functions. Conversely, Scopus is an abstract and citation database of peer-reviewed literature exclusively: it includes a smaller number of documents than Scholar, but it provides smart tools to track, analyze and visualize the research impact of papers. Figure 1 displays the results of a search of the keyword “communities of practice” in Google Scholar, in the “title” field of documents and excluding “citations” and “patents”. The year 2013 was used as the upper time limit.

This is a restricted search (for example, it excludes papers that deal with “communities of practice” but don’t have this keyword in the title explicitly).



**Fig. 1** Number of documents on CoPs retrieved in Google Scholar – annual trend (Original calculations based on data available in Google Scholar)



**Fig. 2** Temporal trend of peer review papers on CoPs retrieved in Scopus (Original calculations based on data available in Scopus)

Also, we opted for “communities of practice” rather than “community of practice” because this last keyword provided a lower number of papers. The total number of retrieved documents is 2,412, which is significant. If we contrast this with the results obtained with other popular keywords in KM we will find similar or lower figures: for instance, “knowledge management systems” produces about 2,300 documents, “knowledge management processes” about 650, “knowledge management strategy” around 900. In short, the topic of CoPs has attracted much interest of the research community.

A temporal trend analysis reveals that the attention to CoPs, in terms of published documents, started growing in around 2001–2002, when the first studies about practical applications have been published. Since then, there has been a strong growth that has reached its peak at the end of the last decade. Subsequently, the annual publication of documents has remained high, which confirms that the interest in the topic is still significant.

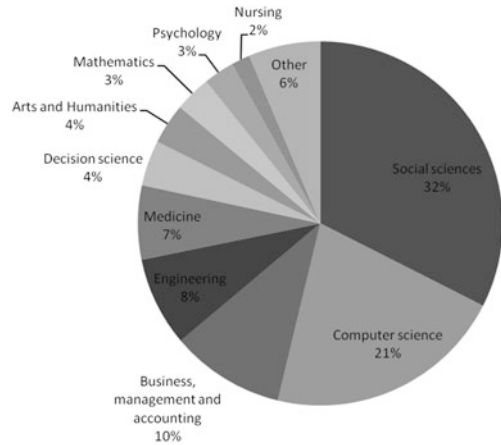
Figure 2 presents the results of a similar search of the same keyword in the “title” field in Scopus database. Although the figures are dissimilar, this source confirms the high interest in CoPs: a total of 1,133 peer-reviewed papers, published mostly in the last 7 years, constitute a considerably large body of studies.

The tools provided by Scopus enable a more thorough analysis, for example the distribution of papers across the different disciplinary areas. Figure 3 well depicts that studies about CoPs range across the most various disciplines, from social sciences to engineering, from business to medicine, which helps in explaining the success enjoyed by the concept and, also, the different application areas.

This is also signalled by the high number of different sources (167). The first ten sources in terms of number of articles include only 141 of the 1,133 retrieved papers; these sources also refer to different disciplines (Table 1).



**Fig. 3** Distribution of papers according to the subject area (Chart based on data available in Scopus)



**Table 1** Sources with the largest number of articles (Original calculations based on data available in Scopus)

Source	N. of papers
Lecture Notes in Computer Science	32
Proceedings of ECKM	21
Proceedings of HICCS	16
Journal of Knowledge Management	14
Ceur Workshop	13
International Journal of Web Based Communities	12
Communication in Computer and Information Science	9
Teaching and Teacher Education	8
Implementation Science	8
Innovations in Education and Teaching International	8

Another signal of the popularity of the notion is that scholars interested in CoPs work everywhere in the world. North American authors lead the research in this field (as it may be expected), followed by UK scholars. In the rest of the world a non marginal place is occupied, in order, by Canada, Australia, France, Germany, Brazil, Italy, New Zealand and the Netherlands (Table 2). In addition, although there is not necessarily a direct link between country of author and country of practical application of CoP (not all papers refer to practical cases, nor an author necessarily treats CoPs in her/his own country), Table 2 can also be an indirect signal of where CoPs have gained higher popularity even in practical terms.

To sum up, the notion of CoP has enjoyed considerable popularity in the last years that does not seem to show signs of slowing. However, as we saw in the previous section, this popularity has been combined with a difficulty to find a stable and unambiguous definition.

In the practice, there has been a proliferation of applications and implementations that has led to different interpretations of the phenomenon and

**Table 2** Countries with the largest number of authors of articles on CoPs (Original calculations based on data available in Scopus)

Author nationality	N. of papers
USA	346
UK	191
Canada	89
Australia	86
France	49
Germany	43
Brazil	33
Italy	29
New Zealand	28
Netherlands	28

to distinct managerial recommendations, as can be noticed by having a closer look at the management literature. In a recent survey, Murillo (2011) traces the evolution of the concept from the first definitions to the latest developments. Based on a search in the EBSCO database, the author confirms what we mentioned earlier: the notion of CoP (or at least this term) has been often employed in the management literature and publications have substantially grown since 2000. In particular, he finds many studies that report organisational arrangements in companies that recall the concept of CoP, or analyse its implications for business management in general.

Agrawal and Joshi (2011) examine the empirical studies published in some of the most impactful management and organization journals. Their analysis allowed collecting information regarding the aspects of CoPs that were studied, the methodology used, and the domain of application. One of the most important findings of this review is that the resulting picture appears to be quite diversified, which confirms what was said in the previous section. No apparent agreement on the definition of CoP or its theoretical and practical use emerges clearly from the literature.

On the contrary, there are some open questions that still lack a proper answer, for example: do CoPs emerge naturally, or can they be intentionally created? Can CoP become an undiversified concept, subjected to only one possible interpretation?

Concerning the last question, Murillo (2011) classifies the studies of CoPs into two main groups: the first group emphasises theory development of emergent and informal CoPs, while the second highlights the business value of CoPs and the strategies to support and/or launch them in companies to manage organisational knowledge. As one can note, these are the same contrasting views between CoPs as self-organising groups and CoPs as structures deliberately designed that emerged in the early studies.

Nevertheless, in the management literature the idea of CoPs as particular organisational arrangements that companies can explicit adopt and manage for business purposes tends to prevail. Also, in this case, there is no “one-size-fits-all” approach which is valid under all circumstances (Agrawal and Joshi 2011). Again, the literature lacks a clear consensus on a “unique configuration” or common idea of CoP even in a well focused environment, i.e. the business context.

In addition, concepts similar to that of CoP are used in the literature to denote other social structures that are related to knowledge and learning: e.g., communities of technological practitioners, occupational community, network of practice, and others (Murillo 2011). Some management scholars use the term CoP to designate learning groups in organisations that don't fit the "usual" concepts of CoP, some others apparently attach the CoP label to any learning group. According to Murillo (2011), many of the existing studies simply lack a theory-grounded model.

The effect is an increased confusion about the meaning of the term and its use: CoP has become an "umbrella term" often employed in the literature in misleading or inappropriate ways. Indeed, the concept of CoP is sufficiently versatile (and somewhat ambiguous) to fit a wide range of organisational structures. In conclusion, a weak point of the management literature about CoP is the lack of an established interpretative framework and of theory-grounded studies striving for conceptual clarity.

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### 3 CoPs in KM

As said, the notion of CoP has become particularly popular and used in KM. This is a direct result of its definitions. In particular, CoPs have rapidly become a key component of any systematic and deliberate KM strategy (Smith and McKeen 2003; Wenger 2004) and, consequently, they have attracted the interest of both professionals and researchers.

Companies are environments where an immense quantity of knowledge is produced, applied, processed, and transformed; but this knowledge is, for the most part, embedded into the mind of individuals and need mobilizing. The experience made in past projects is essential for every new enterprise, not only for avoiding "reinventing the wheel" at any new time point, but also for building innovations over existing knowledge. The problem of circulating knowledge and enabling people exploit the experience of others and, at the same time, making all members contribute to the collective memory of the organisation is therefore essential. CoPs represent an organizational arrangement to solve it.

In a CoP, the way knowledge is exchanged and produced implies voluntary and informal commitment, rather than prescribed participation and pre-defined procedures. It can be said that CoPs retain knowledge in "living" ways rather than in the form of a database or manual (Kakabadse et al. 2003), even when formalized through processes and documentation. CoP formation is strongly practice-led: they are built when people address recurring sets of problems that require a shared base of knowledge. By participating in a communal manner, they can do their job without having to remember everything themselves (Wagner 2000). The CoP model bases on the concept of knowledge defined by Heron (1996) and Nonaka and Takeuchi (1995) which holds that one cannot separate knowledge from practice.

According to Kakabadse et al. (2003), CoPs represent a specific approach to KM, compared to other ways of viewing the management of knowledge in

organisations. In CoPs, sharing knowledge and the sense of participating in a joint cognitive enterprise become essential. Members of a CoP are bound together into a social entity and share a repertoire of communal resources that they have contributed to develop over time through mutual engagement (Wagner 2000).

Also, because membership is based on participation rather than on official status, a community of practice is not bound by organizational affiliation: bridges (and, therefore, knowledge exchanges) can cross organisational boundaries, which enriches the potential of a community to draw knowledge from multiple sources. Any geographical, cultural, and organisational barrier may hinder the effective retrieval, sharing, and reuse of available knowledge between employees and across organisations. The experience shows that knowledge barriers tend to grow among the distinct parts of a large organisation, and these tend to become *knowledge islands* (Franz et al. 2002) with specific (and, sometimes, idiosyncratic) backgrounds, values, languages, schemes, behaviours, etc. In order to bridge such islands – and, by this way, promote knowledge sharing, organisational learning, and rapid innovation – several global corporations have promoted the deliberate creation of internal CoPs (Davis et al. 2005; Archer 2006; Garavan et al. 2007).

One of the main explanations of the resorting to CoPs is the necessity to facilitate knowledge flows among professionals working in a very specific field or sharing practical problems. In a CoP, people can access to and exploit the knowledge of others to improve their responsiveness, problem solving and decision making capabilities. In order to share knowledge, they must build agreement over meanings and perceptions, and develop a common organisational memory for the benefit of the entire company. Also, CoPs are considered as basic building blocks of a *social learning system*, namely a system where learning and knowledge creation occur through socialisation.

In short, the main benefits ascribed to CoPs as particular arrangements for effective KM, include:

- Improved manipulation of tacit knowledge components, by facilitating human interactions;
- Building of a shared organisational memory that helps avoiding reinventing the wheel and favours the exchange of experiential knowledge between senior and junior employees;
- Facilitating responsiveness and problem solving capability, by mobilising knowledge resources scattered across organisations;
- Exploiting informal channels of interaction and knowledge flows.

### 3.1 CoPs in the KM Practice

As mentioned, CoPs have become a key element of the KM toolbox. There are many examples of organizations that have adopted CoPs as an explicit KM tool. Here, there is no room for examining all the cases in detail, but only to provide some essential references, and to categorize the various fields and contexts of

application. In Sect. 4.2, some statistics based on a literature survey will also be provided.

### 3.1.1 Application Context

Firstly, CoPs are an almost ever-present ingredient in the KM programmes of large multinationals. Indeed, an increasing number of global corporations are committed to developing and managing such communities, and including them among their KM initiatives. Very often, the purpose is to build structures that might facilitate the sharing and diffusion of knowledge and, by this way, improve the innovative potential and problem-solving capability of employees. Popular examples reported in the literature, some of which are “the history” of CoPs, include Shell’s “Turbodude” CoPs, that were formed to facilitate knowledge sharing between distinct deepwater exploration teams (Boyd 2004); DaimlerChrysler “Tech Clubs”, where engineers working at different plants can share knowledge of similar problems (Wenger et al. 2002); SAP’s online community, that was established as a means of offering interactive events and other knowledge sharing opportunities to executives and professionals (Fahey et al. 2007); ENI’s CoP system (Scarso et al. 2009), built to facilitate the transfer of knowledge from expert senior employers to younger professionals seeking help for facing particular problems in their oil production site. In private companies, the goals of CoPs are mainly efficiency, rapid problem solving and decision making, by mobilizing resources that can be scattered in different parts of a large organization. In these environments, CoPs generally have the strong sponsorship of top management, and dedicated resources and budgets.

Another sector where CoPs are intensively used is that of consulting companies. Examples include, among others, Accenture (Paik and Choi 2005) and Ernst&Young (Scarso et al. 2010). In these companies, a typical goal of CoPs is helping the management of new clients or new project by connecting knowledge islands, favouring the consolidation of a company’s base of knowledge, and improving individual and collective learning.

A second application context is that of public organisations; here, however, CoPs have been introduced later and more slowly. Examples can be found in the education sector (Handzic and Lagumdžija 2010), in the healthcare sector (Li et al. 2009a; Maracine et al. 2012), and in the public administration (Perez-Montoro and Martinez 2011). Goals are generally to improve sharing knowledge for problem solving in local situations. Important differences between private and public CoPs have been identified (Bolisani et al. 2011); in the public sector there is generally a stronger emphasis on the need to share knowledge for collective benefits in an open context, but at the same time constraints and management problems can derive from the bureaucratic orientation of public organisations. A particular case of CoPs in public institutions is that of supranational organizations like the UN (Bolisani and Damiani 2010); this is also a good example of CoPs that must involve several organisations at the same time.

Professional associations are also a different case of CoPs. Here, single individuals connect and interact even though they don’t belong to a single company

or organization. To build and develop these CoPs, the interest by the single individual in a well defined knowledge domain, and the motivation to share knowledge about specific topics in a discipline or professional challenge, is very important. Popular examples include medical professions (Li et al. 2009b) and education (Kimble et al. 2009), but there are also cases of other professional associations (Hafeez and Alghatas 2007; Bolisani et al. 2006). Since professionals run independent businesses, these CoPs generally need a neutral management board.

### 3.1.2 Kinds of CoP

Although CoPs represent an application of the human-oriented KM approach, many of them find a fundamental support to their activities in ICT applications. These technologies facilitate interpersonal communications and, by this way, oil social interactions and knowledge sharing. The role of technology, however, changes in the distinct cases. Generally speaking, we can distinguish between:

- CoPs that combine organisational arrangements (such as: internal consulting service, workflow management, production and dissemination of case-histories, meetings, incentives and rewards) with enabling technologies (e.g., corporate Web portals, knowledge libraries, online forums, Wikis). In this case, the focalisation is mainly on the reconstruction of the processes of generation, sharing and reuse of knowledge, and on the proper methods (being these organisational or technological) that can be exploited to underpin them;
- CoPs that are intentionally built around available technologies – and are sometimes called “virtual” or “online” CoPs. In this case, the building of a CoP is deliberately orientated towards the exploitation of the potential of ICT systems as a platform for sharing knowledge and improving learning.

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## 4 An Analysis of KM Literature

The rising of CoPs as a natural application in the KM field (Su et al. 2012) has given impetus to a flourishing literature that especially focuses on the KM characteristics of these organisational settings. CoPs and related concepts have been widely used by KM scholars and practitioners, as confirmed by recent studies. For instance, Walter and Ribière (2013) found that CoPs are the first KM “tool” in the keyword list mentioned by authors who published in a leading KM journal such as *Knowledge Management Research & Practice*.

In Sect. 2, we have shown that the evolution of the notion of CoP has led to ambiguities and misuses. It may be expected that a restriction of the focus to a specific field can favour to better focalisation and consistency. With this purpose, the case of KM literature is now analysed. In this section the main results of a systematic review of the KM literature on CoPs are briefly summarised. The findings of a recent study are here presented and expanded. The reader is addressed to Bolisani and Scarso (2014) for methodological details.

In practice, the studies of CoPs published in the main academic journals focused on KM and/or Intellectual Capital (IC), as identified by a recent analysis of Serenko and Bontis (2013b), were examined. Specifically, the first 14 journals of a list built on the basis of expert opinions were selected. Of this list, the International Journal of Knowledge, Culture and Change Management was later excluded, because the publisher's website does not provide a search function nor displays the abstracts of papers. Another journal (The Journal of Intellectual Capital) was also excluded because it had no article concerning CoPs.

It should be noted that nine out of the remaining journals have the term "knowledge management" explicitly in the title. Furthermore, most of the examined journals, especially those focusing on KM, have been founded in the last decade, when this field has begun to attract the attention of the academic world (Table 3). This is the reason why these journals, despite their popularity among KM researchers, are still less known in the broader community of management scholars. In addition, KM journals gained visibility only in recent times: the first KM Journal to be indexed by Thompson Reuters' Journal Citation reports was Knowledge Management Research & Practice in 2010, immediately followed by the Journal of Knowledge Management. For all these reasons, the earliest papers on CoPs have been published in other management journals focusing in various subjects (ranging from Information Systems to Organization Sciences, from Business Strategy to General Management). All this has to be taken into account when interpreting the findings. However, while the management literature addresses the issue of CoPs sporadically, for KM journals it is a central topic.

The journals' online databases were used to search for the phrases "community (ies) of practice" and/or "CoP(s)" in the "abstract" field. Papers from 1997 (the foundation year of the leading academic journal in KM and IC, according to Serenko and Bontis's list) to 2012 were considered. Finally, the retrieved articles

**Table 3** List of examined journals

Title	Acronym	First year of publication
Journal of Knowledge Management	JKM	1997
Knowledge Management Research & Practice	KMRP	2003
International Journal of Knowledge Management	IJKM	2005
Journal of Information and Knowledge Management	JIKM	2002
The Learning Organization	LO	1994
Journal of Knowledge Management Practice	JKMP	1998
Knowledge and Process Management	KPM	1997
International Journal of Learning and Intellectual Capital	IJLIC	2004
Electronic Journal of Knowledge Management	EJKM	2003
VINE: The Journal of Information and Knowledge Management Systems	VINE	2003
International Journal of Knowledge and Learning	IJKL	2005
International Journal of Knowledge Management Studies	IJKMS	2006

were analyzed, and those that deal with CoPs only marginally were eliminated. In total, 89 papers published in 12 journals were identified and examined (Table 4). JKM ranks first in terms of number of papers devoted to CoPs, followed by EJKM. Studies on CoPs are almost absent in Journals like IJL&IC, VINE, IJK&L, IJKMS.

A more thorough analysis of the temporal trend, in terms of number of papers (Fig. 4), shows that the first articles appeared in around 2003, 1 year after the seminal publication of Wenger et al. (2002). A peak is reached in 2007, when The Learning Organization published a Special Issue on CoPs. In the last 4 years, the annual number of papers has been fluctuating. The figure of 2013 is only partially representative (not all issues of that year are available).

Each article was examined to capture the following information: (a) type of article; (b) domain of application; (c) methodology used; (d) academic impact; (e) addressed topic; and (f) application field, for empirical papers.

## 4.1 Type of Paper and Research Method

It is possible to distinguish between conceptual and empirical articles, where the latter include all the papers that make use of data derived from an original empirical investigation. Sixty nine papers were classified as empirical, while the remaining twenty as conceptual/theoretical. Even though this is a rough classification (in fact, various empirical papers aim at testing conceptual frameworks or interpretative hypotheses developed by their authors, so their orientation is mixed), it reveals the pragmatic and practice-oriented approach that denotes the literature on CoPs specifically connected with KM. This cannot be otherwise, because KM scholars consider CoPs as a powerful tool for sharing knowledge.

Table 5 shows frequency distribution of research methods employed in empirical studies. The count overlaps as many articles used more than one method of study. Similarly to what found by Agrawal and Joshi (2011), qualitative methods prevail. Many studies are descriptive and exploratory in nature: their authors justify this by stating that they had to address a complex and still little known phenomenon. Several case-studies merely illustrate the usefulness of CoPs as a mechanism for managing knowledge effectively in a specific situation, and related issues.

## 4.2 Application Domain

Here, some statistics about the domain of application and kind of CoPs are presented. Figures are calculated based on the subjects treated in the KM papers surveyed – more precisely, only those that present empirical studies (and in particular case-studies): therefore, it is just a sort of “indirect survey” of what is happening in the real world. However, it can give an idea of the areas where the interest in CoPs is more significant.

It is interesting to note that about 60 % of the empirical papers report cases of CoPs formed in the (private) business domain, 25 % in the public (educational,

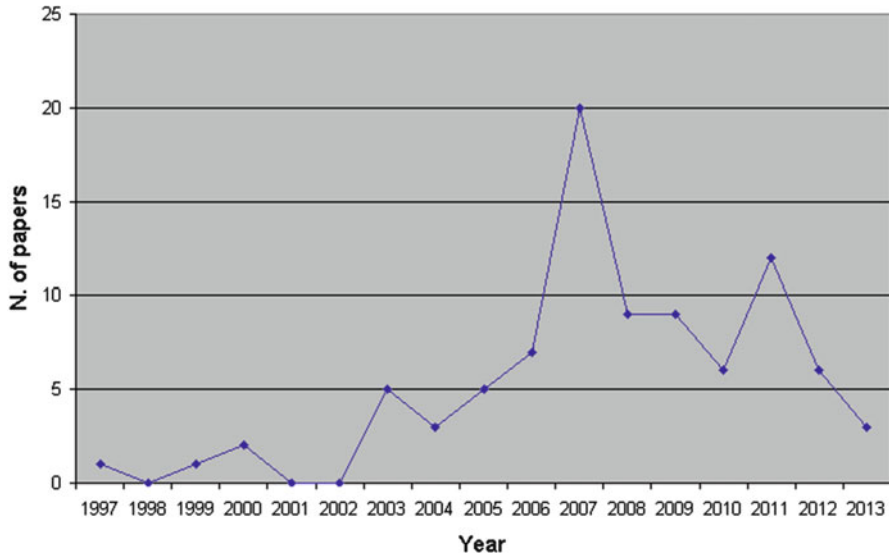


**Table 4** Articles on CoPs in the main KM Journal

Journal	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOT
JKM			1	2			1		1	3	1	2	4		4		2	21
KMR&P							2		1		3			1	1	1		9
IJKM <sup>a</sup>									1	2	1	2			1	1	1	9
Jl&KM <sup>a</sup>											1					2		3
LO								1			7	1						9
JKMP <sup>a</sup>											2	2	1	1	1			7
K&PM	1							1		2		1		1	1	1		8
IJL&IC								1							1			2
EJKM							2		2		3	1	3	1		1		13
VINE															2			2
IJK&L <sup>b</sup>											1			1	1			3
IJKMS <sup>b</sup>											1		1	1				3
<b>TOT</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>3</b>	<b>5</b>	<b>7</b>	<b>20</b>	<b>9</b>	<b>9</b>	<b>6</b>	<b>12</b>	<b>6</b>	<b>3</b>	<b>89</b>

<sup>a</sup>At the time of the review, not all the issues of 2013 were published

<sup>b</sup>At the time of the review, no issue of 2013 was published



**Fig. 4** Time trend of number of published papers on CoPs in KM Journals

**Table 5** Employed research methods

Method	Times
Case study	28
Interview	17
Survey	16
Document analysis	7
Action research	7
Observations	4
Others	1

health-care, governmental, etc.) domain, and only 15 % regarded communities of individuals (professionals, customers, students, etc.). Despite the fact that communities of independent professionals have been indicated as an important manifestation of this organisational arrangement, the orientation of KM practice towards CoPs operating in a specific environment (e.g. company, institution, agency) is evident. In addition, the relatively lower attention to public organizations compared to private companies can be explained by the fact that the former have shown interest in KM later than companies.

Large organizations are the majority of the cases examined: more precisely, 41 % of papers treat CoPs in very large companies, institutions or multinationals, and only 5 % are small and medium sized companies; the other papers refer to professional communities, or don't clearly report the size of the analyzed company. This may be an indirect confirmation that CoPs are, generally, more appropriate for large organizations.

**Table 6** Application sectors

Manufacturing	17 %
Ict and electronics	16 %
Education	13 %
Public government	12 %
Business services	9 %
Retailing	8 %
Other professions	7 %
Healthcare	5 %
Oil	4 %
Construction	4 %
Unspecified	5 %

Virtual CoPs represent about one third of the cases reported in the examined literature. This is a significant number, but it also shows that CoPs are still more considered a “human-oriented” KM tool rather than a hard application of ICT systems.

Finally, Table 6 shows some statistics about the main application fields. Manufacturing (i.e., cars, mechanical equipment, etc.) is the most important sector, followed by ICT and electronics, education (either public and private), public government, and business services (mainly consulting).

### 4.3 Significant Issues

A specific analysis was made to understand the hot topics and significant issues that the literature treats. First, the academic impact of the papers was measured in terms of the number of citations provided by Google Scholar. We used this figure instead of the Scopus citations database for two reasons. First, not all the examined journals are indexed by Scopus; second, Google Scholar takes into account a wide range of sources, and not only peer-reviewed articles.

The most impactful journal is JKM, whose papers on CoPs have an average of 99 citations each, followed by LO and EJKM with nearly 34 citations and 24 citations respectively. A discrete influence has been exerted by KMR&P and K&PM. The others are practically negligible. As regards the single papers, the most cited are reported in Table 7. It is interesting to note that six of the ten papers have the adjectives “online” or “virtual” in the title, which signals the interest of KM practitioners for this kind of communities. Considering how many time papers not published in KM journals have been quoted, the overall impact of the KM literature on CoPs results to be somewhat limited. This is certainly due to the fact that this literature still has a low visibility outside its specific area.

An attempt was made to classify the articles on the basis of the issues they addressed, but this task resulted to be much more difficult than expected. In particular, the examined papers adopt so many perspectives on CoPs, and have so different aims, that it is rare to find two or more papers that exactly focus on the

**Table 7** Ten most cited KM articles on CoPs (Original calculations based on data available in Google Scholar)

Authors	Year	Title of the paper	Journal	N. of citations
Ardichvili et al.	2003	Motivation and barriers to participation in virtual knowledge-sharing communities of practices	JKM	879
Hildreth et al.	2000	Communities of practice in the distributed international context	JKM	339
Ardichvili et al.	2006	Cultural influences on knowledge sharing through online communities of practice	JKM	220
Cothrel and Williams	1999	On-line communities: Helping them form and grow	JKM	196
Sharrat and Usoro	2003	Understanding knowledge-sharing in online communities of practice	EJKM	182
Kimble and Hildreth	2005	Dualities, distributed communities of practice and knowledge management	JKM	81
Usoro et al.	2007	Trust as antecedents to knowledge sharing in virtual communities of practice	KMR&P	79
Adams and Freeman	2000	Communities of practice: bridging technology and knowledge assessment	JKM	74
Bourhis et al.	2005	The Success of Virtual Communities of Practice: The Leadership Factor	EJKM	66
Dewhurst and Cegarra Navarro	2004	External communities of practice and relational capital	LO	63

same topic. Basically, it is just possible to provide an outline of the issues that appear to be most frequently treated. This, however, allows to understand the main challenges in terms of KM practice and CoP management.

### 4.3.1 CoP Formation

The process of formation and development of CoPs is a quite popular topic. A good number of papers aim at learning some lessons that might be useful to managers wishing to intentionally create new CoPs in the future. There is also a paper that discusses a case of failure to discover how to deal with unsuccessful CoPs (Chua 2006). All the described examples refer to both private and public organizations.

Even though these contributions are interesting, they show some limitations, in particular as regards the possible development of a consistent body of knowledge on CoPs. The lack of a common conceptual reference to detect and analyse CoPs leads to non comparable conclusions, and makes the findings of these studies difficult to generalise. This problem affects other articles that analyse specific aspects (e.g., leadership and management roles, rewarding systems, and enabling tools) in a purely descriptive view. Some of the discussed cases don't even show the classic traits of a CoP.

### 4.3.2 Role of ICT Applications

As seen above, a topic that has aroused the interest of several scholars is that of online/virtual CoPs: the assumption is that virtual communities have peculiar characteristics and their management requires special approaches. In particular, these studies investigate the role played by information and communication technologies as a factor that enables distant and asynchronous communication.

### 4.3.3 Success Factors

Another issue that has attracted many scholars concerns the factors that can facilitate or hinder the participation and knowledge-sharing within a CoP. Two groups of contributions can be identified. The first one includes papers that deal with a single factor (e.g., trust, culture, rewards, technology, and psychological aspects); the second group is compounded by papers that take into account the combination of various factors. Usually, the articles of the second group base their analysis on a richer conceptual framework, drawn from variegated theoretical approaches, while the first group is more exploratory in nature.

Some other articles aim at demonstrating that a one-size-fits-all approach does not work with CoPs. Finally, there are a couple of papers that provide tentative classifications of the different kinds of CoPs. Other more marginal issues include: how to evaluate a CoP's performance; cultural obstacles that hinder the exchange of knowledge between CoPs; role of external communities (e.g., formed by customers) in creating the relational capital of an organization.

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## 5 Hot Issues and Emerging Trends: A Discussion

The review confirms that CoPs has raised and continue to raise the interest of both KM academicians and practitioners. Despite the focalisation of the KM literature on the typical research topics and approaches that characterize the research in this field, the studies of CoPs conducted in this perspective are rather heterogeneous. Many issues are discussed, often adopting different viewpoints, and with different conceptual references. In other words, as in the case of the "general" management literature, the restricted focus has not led to improved consistency.

Instead, it may be argued that the growing popularity of CoPs has brought about a sort of loss of identity of the concept, and there is no agreed position about what a CoP should be and how this notion may be applied in KM. Almost all the authors cite the seminal works by Wenger, but only to recall his definition of CoP that, in any case, leaves ample room for different interpretations and applications. For example, some KM scholars consider this notion just as a conceptual reference for reflecting about learning in social dimension; others see it as a social phenomenon that is not programmable but largely emerges spontaneously over time (Harvey et al. 2013); and there are those who regard it as a KM tool that must be planned, designed and managed.

Generally speaking, in the case of CoPs, practice seems to precede theoretical reflections: many KM scholars just follow a pragmatic approach. The idea is that,

since organizations adopt CoPs and claim they have benefits, it is just worth studying their practical aspects. Even though this pragmatic approach is a common attitude in KM (Serenko and Bontis 2013a), it can bring about problems that hinder the conceptual development of the discipline. First, many studies tend to analyse single aspects of a CoP without an interpretative model, which undermines the value of findings and the possibility to compare situations and draw general conclusions. Secondly, the focus on empirical investigations has led some scholars to find CoPs even where there aren't any, thus creating confusion about the term, which in some cases has been used inappropriately.

The above points provide some suggestions for a future research agenda. First, there is the need to discuss and find consensus on a definition of CoP that can be used in the KM field. Even Wenger and colleagues (Wenger et al. 2002) offer vague definitions, and the variables that they have provided for testing the existence of a CoP in a particular organization can be difficult to operationalize. Hence, it would be worth reflecting on this issue, since the use of agreed identifying criteria would make the comparison between the different studies possible. To simplify the problem, it may be wise to initially restrict the analysis to a particular category: CoPs intentionally created within a business organization.

Besides, since a large amount of empirical evidence is available, this could be used to develop *conceptual frameworks* that allow analyzing the phenomenon of CoPs in its wholeness. This would be desirable, even for those researchers who are concerned primarily with practical issues. Also, given the existence of various forms of CoPs, each with specific features, strengths, and challenges, any attempt to develop *appropriate classifications* should be encouraged. A distinguishing factor is that existing organizational environment can influence the kind of CoP that can be created in it. It is also worth noting the relative shortage of KM studies on CoPs created in public organizations: nowadays, CoPs are spreading quite rapidly in the public domain (especially in the healthcare sector – Li et al. 2009b), and in the educational sector. These areas can represent an appropriate terrain of fresh investigations.

Usually, scholars that study CoPs as a typical KM tool do not even raise the question of whether or not these can be managed. They start from the taken-for-granted assumption that CoPs *can* (and must) be intentionally designed, created and cultivated. This does not mean that it is an easy task, and that a one-size-fits-all approach is suitable for every case. Therefore, further research is needed to explore the issues related to a successful management of CoPs.

To do that, a purely empirical/exploratory approach, which has often been adopted by scholars, is no longer sufficient and should be replaced by more rigorous methods of analysis. As regards the methodological approaches, qualitative methods prevail, and many studies are purely descriptive or exploratory case-studies. It may also happen that, in doing this, the concept of CoP used so far (and perhaps the term itself) should be revised being not entirely able to fully represent the reality. In any case, the introduction of new conceptual categories and terms should not scare researchers if this can help to enrich the analytical toolbox and to achieve a better understanding of the phenomenon. In addition to qualitative

methods, that still tend to prevail in descriptive and exploratory studies, quantitative research should also have an increasingly important place.

The analysis of the state-of-the-art of KM studies on CoPs can also provide food for thought to practitioners. The lack of agreement on definitions and interpretative frameworks about CoP formation and management has led executives to adopt their own perspectives and self-made guidelines. This resulted in the proliferation of arrangements and organisational solutions that are still called CoPs but may have little in common with one another. Hence a real problem, which executives should be aware of, is that the specialized literature can really provide numerous descriptions of different situations and experiences, but on the other hand the possibility to replicate and transfer best practices from a company to another is generally limited, and affected by the characteristics of the specific situation.

The connection of CoPs with other “components” of KM in a company is also unclear. Accordingly, it would be desirable to have a tighter connection between CoPs and business strategies (and, more precisely, KM strategies) in order to align this peculiar organisational arrangement with the specific goals of the single company. Particularly, from a KM point of view, it should be clarified under what conditions and for solving what KM problems CoPs can be a good organisational practice compared to other options, especially in case of geographically dispersed companies.

Another issue that deserves analysis is whether and how CoPs can be really applied to small businesses. As we mentioned, CoPs seem particularly appropriate for large organizations, so it should be investigated what configurations and management styles can fit the structure and the needs of small businesses.

A final issue is that of inter-organizational CoPs, i.e. CoPs that cross the boundaries of the single organisation. Here, a reflection on benefits and disadvantages of sharing knowledge beyond the walls of a company, and the proper management mechanisms and knowledge protection tools that can be employed, should be made.

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## **6 Conclusion**

### **6.1 Lessons for KM Research**

The analysis of the “story” of CoPs provides important lessons to those who hold dear the development of KM as a specific – and, to some extent, independent – academic discipline. A first point to recall can be associated to the nature itself of KM. This is a transversal field whose boundaries are open and change over time. Consequently, concepts and theories are often derived from other (more established) disciplinary areas. As the case of CoPs demonstrates, this leads to a need to transfer and adapt notions and models to the particular problems of KM, which can be no easy task. For example, our review of the literature shows that both practitioners and scholars tend to adopt a definition of CoP provided by others that

is functional to their specific purposes. Or conversely, they adopt general (or ambiguous) definitions that can include a large number of real life instances.

Of course, taking from other fields can enrich the theoretical and methodological toolbox of KM, but this can also make comparison of theories and their applications more difficult. Also, KM research on CoPs may be affected by instabilities and changes caused by the “external” evolution of notions and definitions. The development of a line of research, “internal” to the KM field and grounding on its own typical elements (e.g., notion of knowledge, KM processes and roles, knowledge strategies), may contribute to face those problems.

The case of CoPs is paradigmatic for another reason. KM is strongly practice-oriented: this may be understandable, but as the studies of CoPs show, it may lead to very controversial notions and frameworks. In the history of science, it is not the first time that practice pushes theory, but it is important to recognize this situation and plan research consistently. A purely pragmatic and contingent approach can be beneficial initially, but can later cause problems that cannot be ignored.

Another characteristic feature of KM is that, in this field, the conceptual models that lead research are influenced by two extreme position: on the one hand, “hard” technological approaches that see knowledge as an object that can be processed automatically and are clearly dependant from the advancements of computer sciences; on the other hand, the focus on tacit knowledge and the idea that KM simply refers to boosting human-based cognitive relationships and learning processes, which is clearly influenced by sociological and psychological studies. This dichotomy is somewhat misleading. As we mentioned, CoPs have often been seen as a paradigmatic example of “organisational system” for handling tacit knowledge; however, as the KM studies show, the practical applications of this notion have led to mixed solutions that combine both socio-psychological and technological approaches. For instance, “virtual CoPs”, i.e., organisational solutions that make intense use of ICTs for connecting people and facilitating their interactions, have been widely studied and promoted. Again, this shows that KM offers a good terrain for experimenting new and autonomous approaches both in research and practice: in relation to this, the study of CoPs offers a very good opportunity.

## 6.2 Lessons for KM Practice

The analysis also allows to draw useful lessons for KM practice and CoP management. First of all, it is confirmed that CoPs are interesting solutions for companies, because they allow to combine individual and organizational learning. They have fully reached their place in the KM toolbox. In addition, since CoPs are appropriate for enabling social interactions and managing tacit contents, they can help to overcome the rigidity of purely technology-oriented KM solutions.

An open question is that or the replicability of solutions. Given that standard references for building and managing CoPs are still missing, each organization develops its own solutions, which makes this arrangement purely contingent. Here, a problem for CoP managers is how to draw inspiration from the vast but non



systematic collection of case studies that are already available: it may be difficult to simply replicate solutions adopted by others if there are not communal references and notions.

Another issue is the managerial style. We mentioned that, in KM, CoPs are often considered “managed solutions”, i.e. not merely informal networks of people that self-organise themselves. But how to find the proper style to manage a CoP – and, especially, how to find the proper balance between informal supervision and strict managerial control – are still open questions, whose answer depends on and is largely influenced by specific context of application. Companies are, apparently, adopting a “trial-and-error” approach, and there are examples of success but also failure whose causes are, however, difficult to analyze and understand if they are studied as single isolated cases with their peculiar history and characteristics. Here, there is still the need to identify the connection between structural or strategic characteristics of a company and the most appropriate CoP management style.

Adopting a particular CoP management style also implies decisions about some relevant aspects. First, the identification of specific professional positions and the assignment of special tasks of CoP management. Again, the experience of companies largely varies, and it is difficult to find a systematic approach. Secondly, motivating participation: a CoP with too few active members is a contradiction, so it is necessary to facilitate participation of both experts and less skilled members. Again, the lessons from the practice are controversial: different solutions have been attempted – from economic rewards to gaining reputation and favouring a culture of knowledge sharing. Again, a “do-it-yourself” approach seems to prevail, with varied results, although it is becoming clear that, more than pure economic rewards, it is the development of a trustworthy climate of sharing that can make the difference.

A final comment on if and how CoPs can be extended to areas that have been so far less involved. Firstly, there is still the need to identify the proper ways to transfer the most successful practices of CoPs in private companies to the public sector, that can’t be automatic considering the peculiarities of public services compared to the business sector. Secondly, CoPs are generally considered solutions for large companies: indeed, the application of this practice to small businesses may require special solutions.

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## Part III

# Predicting the Future

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# Future Research in Knowledge Management: Results from the Global Knowledge Research Network Study

Peter Heisig

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## 1 Introduction

Over the last two decades the role of knowledge in organizations has attracted considerable attention from organizational practice and academia (Blackler et al. 1993; Nonaka 1994; Grant 1996; Beamish and Armistead 2001; Jasimuddin 2006). A broad research community has emerged, supported by 25 peer-reviewed journals (Serenko and Bontis 2013a) which has attracted scholars from fields such as management, information management and library sciences, psychology and organizational studies, sociology and computer sciences, engineering, medicine and philosophy (Venzin et al. 1998; Alavi and Leidner 2001; Argote et al. 2003; Gu 2004; Baskerville and Dulipovici 2006; Nonaka et al. 2006; Martin 2008; Wallace et al. 2011; Lee and Chen 2012). The assessment of the knowledge management (KM) field ranges from suggestions that KM is in a state of “pre-science” with different paradigms and disagreement about fundamentals in the field (Hazlett et al. 2005) to others seeing a ‘healthy arena with a strong foundation in multiple theories and clear direction for future work’ (Baskerville and Dulipovici 2006) or even those who advocate to move on ‘beyond KM’ (Lehaney et al. 2004; Jordan and Mitterhofer 2010).

In organizational practice, one can hardly find any sector which has not embarked on a project or program to improve the use of knowledge inside the organization. KM projects have been carried out in areas such as aerospace and construction industry, in farming and consumer goods, in medicine and nuclear energy, etc. KM is still among the 25 most popular management tools, but with low satisfaction scores (Rigby and Bilodeau 2011). It was claimed that KM continues to suffer from an image problem arising from its overselling by vendors and consultants in the 1990s (Martin 2008). Nevertheless, a representative study of

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businesses in Germany ( $n = 3401$ ) concluded that knowledge-oriented management has a significant influence on performance (Pawlowsky et al. 2011; Pawlowsky and Schmid 2012).

After more than two decades of KM research which has attracted researchers from a multitude of different academic disciplines, practitioners from a broad range of different industries and different sectors of societies around the globe, the Global Knowledge Research Network (GKRN) decided that it was a timely juncture to review the field and suggest a roadmap for future research in KM. Our study aims to identify advancements and challenges in KM theory and KM practice, and future KM research needs. We used an interview approach to incorporate the views of both, KM researchers and KM practitioners from around the world. A review of the academic literature would have missed the input from practitioners around the world as their share in academic publications decreased from 48.3 % in 1997 to 10.1 % in 2008 (Serenko et al. 2010) and KM research needs to increase its practical relevance too (Booker et al. 2008).

Global Knowledge Research Network – Vision and Aims: A global network of leading experts whose purpose is to advance the understanding and solving of knowledge related challenges in theory and practice from multi-disciplinary and global perspectives. We aim to provide practical solutions based on profound theoretical understanding and rigorous research.

We aim . . .  
 . . . to undertake world-class collaborative research,  
 . . . to provide evidence-based advice to address practical challenges,  
 . . . to consolidate and advance the theoretical understanding of knowledge management and  
 . . . to support the development of communities based on the efficient use of knowledge management and experience. (Heisig and Samuel 2013)

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## 2 Research Method

### 2.1 Research Instrument

The study adopted an explorative research approach which aimed to elicit the views of KM experts about the main research dimensions. The interview guide was based on previous research (Scholl and Heisig 2003; Scholl et al. 2004) and the core dimensions derived from KM frameworks (Lehaney et al. 2004; Heisig 2009) accepted in Europe (CWA 14924) (CEN 2004) and Asia (APO 2009). The initial network partners reviewed and commented on the proposed instrument. The dimension “knowledge society and knowledge economy” was included which reflected the notion of the knowledge-based development of societies. In April 2012 ethical approval was granted and pilot interviews in Denmark and Germany undertaken. No changes to the instrument were required.

The final interview guide consists of the following sections:

- (A) Demographic data (A1–A11)
- (B) Achievements, Challenges, Approach in KM Theory (B1–3) and KM Practice (B4–6)
- (C) Core Concepts: Knowledge and Knowledge Management (C1–5)
- (D) Research needs regarding Knowledge Management Dimensions (D1–D8) (Importance; Rationale; Methods; Timeline)
- (E) Education and Teaching for KM (E1–E3)
- (F) Comments – Suggestions – Feedback (F1–F3)

The sections B, C, D, E and F contained only open-ended questions while basic demographic variables were chosen for section A. In order to prioritise future research needs, a five-point Likert scale for importance (“How important research in this area should be in the future?”) and a three-point time line (Until 2015 – Until 2020 – Until 2025) was given in section D.

The research partners agreed to apply a purposeful sampling approach with the aim for 10 KM experts per country representing equally academic KM research and KM practice. A person should be considered as a KM expert if they have conducted and published research within the KM field on a national or international level or if they have held or hold a management role responsible for KM for a minimum of 5 years. KM experts come from different disciplinary backgrounds representing the diversity of disciplines contributing to KM (Jasimuddin 2006; Maier 2004; Serenko and Bontis 2013b). The KM experts from practice should represent different industry sectors. After the first initial discussions with research partners in May 2011, the research started with the first partners undertaking interviews in April 2012. The last input was received in January 2014.

## 2.2 Sample

The final sample contains 222 replies from KM experts including interviews with 127 experts with around 6900 min recording time and 95 replies in writing. The average KM experience of the interviewees is 12.3 years (from 1 year up to 63 years who is a records manager). Our sample includes 77 % male and 23 % female experts. The 222 answers represent KM experts from 38 countries and 42 nationalities. The following Tables 1, 2, 3, 4, 5, and 6 provide more descriptive data about the sample.

**Table 1** KM experiences in years

<5 years	5–9 years	10–14 years	15–19 years	20–24 years	>25 years
10.4 % (23)	23.5 % (52)	29.7 % (66)	20.8 % (46)	6.3 % (14)	6.8 % (15)

**Table 2** Started with KM in year

Before 1995	1995–1999	2000–2004	2005–2009	2010+
15 %	28.8 %	26.9 %	19.2 %	10.1 %



**Table 3** Regional distribution of KM experts

Europe	America	Asia	Africa
51 % (114)	24 % (54)	15 % (32)	10 % (21)
Austria, Bosnia & Herzegovina, Croatia, Denmark, Finland, France, Germany, Hungary, Israel, Ireland, Italy, Netherlands, Poland, Portugal, Spain, Sweden, Switzerland, United Kingdom	Brazil, Canada, Chile, Colombia, Mexico, Trinidad & Tobago, Uruguay, USA	Hong Kong, India, Indonesia, Japan, Sri Lanka, Thailand	Egypt, Ethiopia, Kenya, Morocco, Nigeria, South Africa

**Table 4** Distribution of KM experts by roles

Practitioners			Academia			
KM role		Director/ manager	Other roles	Professors	Lecturers or researchers	Other role in academia
Internal	External					
24.4 % (54)	6.8 % (15)	13.6 % (30)	10.4 % (23)	30.8 % (68)	10.8 % (24)	6 (2.7 %)

**Table 5** Sectorial distribution of KM experts

Business	Academia	Government	International organisations/NGO		
50.2 % (111)	45.2 % (100)	3.2 % (7)	1.4 % (3)/ 0.5 % (1)		
Consulting & professional services		IT & software	Energy & raw material	Aerospace	Government
16.7 % (37)		9.0 % (20)	5.4 % (12)	3.6 % (8)	3.2 % (7)
Electric	Banking & insurance & finance, chemical & pharmaceutical, engineering & capital goods	Construction	Automotive, consumer goods, food & agriculture, tele-communications, other services, other manufacturing		Media & film and trading
	Each 1.8 % (4)		1.4 % (3)	Each 1.4 % (2)	
2.3 % (5)					

**Table 6** Distribution of KM experts by disciplines

32.7 % (72)	16.4 % (36)	9.1 % (20)	7.3 % (16)	6.4 % (14)
Business & management	Engineering	Information sciences	Computer sciences	Knowledge management
Each 3.2 % (7)	Each 2.7 % (6)	Each 1.4 % (3)	Each 0.9 % (2)	Each 0.5 % (1)
Economics, sociology	Philosophy, natural sciences, psychology	Business information systems, law	Architecture, geology, political sciences	Humanities, languages, art

### 2.3 Data Gathering and Preparation

The interviews were transcribed by each research partner into a Word template provided by the coordinator. The interviews conducted in native languages (e.g. Arabic, German, Hebrew, Japanese, Portuguese, Spanish) were translated into English language and transcribed by the interviewer. All written responses were in English. All interview transcripts and written responses were forwarded to the coordinator and imported in Nvivo9. The first coding mapped the sections and sub-sections of the interview guide (Fig. 1).

### 2.4 First Data Analysis

The coordinator extracted the answers for each section (B to E) and forwarded them to 11 teams of researchers from different countries and continents who independently conducted the first data analysis. The partners were asked to read the interview data in order to identify topics and themes emerging from the material and suggest categories (King 1998; Strauss and Corbin 1998). No a priori defined topics were given to the partners. The workshop revealed that the partners suggested themes based on the frequency of appearances in the interview data as

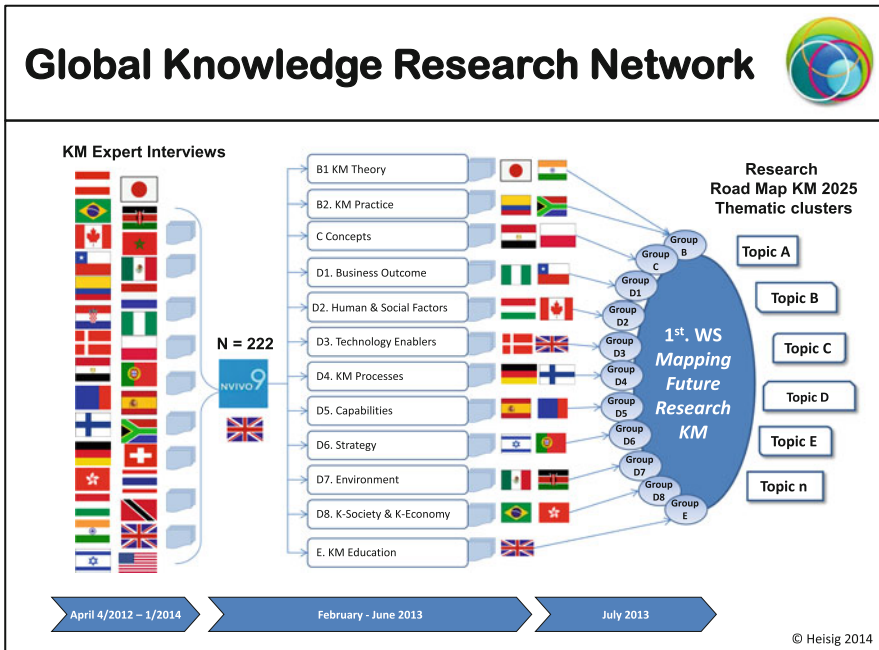


Fig. 1 Overview of research road mapping process

the first step. Further thematic analysis with categories derived from the literature will be conducted at the next stage.

The first GKR Network workshop was attended by 22 researchers from 20 countries from 17 to 19 July 2013 in Leeds. First research pairs familiarised themselves with their independent analysis, discussed the topics each partner identified and agreed on a joint set of main topics (B to D8). After the presentation of the results and the discussion with the workshop participants, core topics were extracted and written on post-it notes for each section. In a final session all members went through all post-it notes and clustered similar and related topics in one theme. Finally a label was suggested and agreed for each thematic cluster. A total of 11 clusters were identified.

In the following sections we report the quantitative findings, illustrated with first results from the content analysis of the interview data. Experts quotes are coded starting with country code ISO 3166: AT = Austria, GB = Great Britain. All academic replies have as the third letter block 'HE' for Higher Education, e.g.: GB-01-HE-PRO-12-BM (see Annex). The researchers who contributed to the first analysis are listed in the acknowledgement section. The author likes to thank all partners and assumes the sole responsibility for the following interpretation.

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### 3 KM Theory and KM Practice: Advancements: Challenges: Approaches

Recent advancements in organizational KM practice (97 %) and KM Theory (87 %) were reported by a very broad majority of experts answering these questions with no differences between the academic (96 %/86 %) and practitioners (98 %/88 %) communities (Table 7).<sup>1</sup>

Despite this agreement in terms of advancements, the analysis of the interview data shows a very heterogenic picture and no clear consensus about these advancements. The only theme which stands out from the multitude of different issues mentioned in both questions regarding KM Theory (B1) and KM Practice (B4) is '*social networking/social media*' (B1: about 10 %; B4: about 16 %).

In regards of the challenges facing KM theory, one common theme emerging from the interview data is the '*link between KM and organisational outcomes, such as performance and value-creation*'. This need is supported by the quantitative data regarding the importance of future research needs. Two thirds (66 %) of all experts

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<sup>1</sup> The first analysis for KM Theory was undertaken by Remy Magnier-Watanabe (University of Tsukuba, Tokyo, Japan) and Narendra M Agrawal (Indian Institute of Management Bangalore, India) and for KM Practice by Aldu Cornelissen (University of Stellenbosch, South Africa) and Ernesto Amaru Galvis Lista (Universidad Nacional de Colombia, Bogotá, Colombia).

**Table 7** Percentage of experts suggesting advancements in KM theory and KM practice

B1. What is the most important recent theoretical advancement in KM?						
B4. What is the most important recent practical advancement in KM?						
Advancement in . . .	All experts		Academia		Practice	
	Yes	No	Yes	No	Yes	No
<b>B1. KM theory</b> (n = 151)	87 % (131)	13 % (20)	86 % (73)	14 % (12)	88 % (58)	12 % (8)
<b>B4. KM practice</b> (n = 177)	97 % (172)	3 % (5)	96 % (76)	4 % (3)	98 % (96)	2 % (2)

(academia: 72 %; practice: 65 %) assessed research around this theme as ‘highly important’.

The lack of agreement among experts regarding the advances might be due to the suggestions made to the question ‘which theoretical approach and/or scientist is most likely to deal effectively with this theoretical research issue’. About 20 % of the experts suggest an ‘interdisciplinary approach (integrating several disciplines such as artificial intelligence, economics, sociology, anthropology, culture studies, OB, . . .)’. (MA-01-HE-PRO-12-BM) Similar, “(. . .) that a much more inclusive, expansive, multi-dimensional perspective on what knowledge management involves needs to be used.” (CA-08-CPS-DIR-13-BM)

Our result confirms the conclusions from a Delphi study conducted in 2001/2002 about the future of KM that “the most promising theoretical approaches are interdisciplinary and multi-disciplinary approaches, combinations of respective methods and techniques (. . .) and empirical research designs (. . .). That means, that scientific work from a purely disciplinary perspective falls short of the real problem and much more interdisciplinary and empirical work is needed on KM than until now. KM approaches have to integrate different perspectives in order to provide useful help for the organizational practice” (Scholl et al. 2004), p. 31).

## 4 Core Concept: Knowledge

Previous research (Scholl et al. 2004) surprisingly concluded that the most mentioned distinction between implicit/tacit and explicit knowledge (Polanyi 1985; Nonaka and Takeuchi 1995; Ambrosini and Bowman 2001; Collins 2001; McAdam et al. 2007; Venkitachalam and Busch 2012) used in KM Frameworks (Heisig 2009) was not seen as a promising theoretical and practical approach. Therefore this study aimed to gather the understandings of knowledge (C1) and elicit requirements regarding the need to undertake research into the theoretical understanding of “Knowledge” (C2) or empirical research (C3).<sup>2</sup>

<sup>2</sup>The first analysis was undertaken by Joanna Paliszkievicz, Magdalena Madra (Warsaw University of Life Sciences, Poland) and Nasser Fathi Easa (Alexandria University, Egypt).

**Table 8** Percentage of experts suggesting research about the concept of knowledge

Knowledge	All experts		Academia		Practice	
	Yes	No	Yes	No	Yes	No
<b>C2. Theoretical</b> (n = 177)	67 % (118)	33 % (59)	<b>80 %</b> (67)	<b>20 %</b> (17)	<b>55 %</b> (51)	<b>45 %</b> (42)
<b>C3. Empirical</b> (n = 164)	87 % (143)	13 % (21)	94 % (74)	6 % (5)	81 % (69)	19 % (16)

The majority of experts (All: 87 %; Academia: 94 %; Practice: 81 %) see a need to undertake empirical research into the concept of knowledge while academics and practitioners differ in regards to the need of more theoretical research (Table 8).

In regards to the underpinning theoretical understanding of ‘knowledge’ practitioners differ in their assessment of the need for more research. A dominant rationale is that *“I do not believe so. Several authors have spent time studying this subject”* (BR-05-CPS-EKM-14-OD) or *“It has been sufficiently researched”* (IL-09-ITS-CKO-15-NA). Others suggest *“No. I think that that’s a pretty well understood concept. I think not only in the academic literature, but in the practitioner world. I think most agree there’s two types. There’s the stuff that we write down, and the stuff that’s in our heads. I think it’s actually a very robust model”* (CA-07-HE-PRO-18-KM). Moreover, it is suggested to leave this discussion to philosophers and concentrate on organisational knowledge and its creation: *“I think from a knowledge management perspective we should not get involved in researching what is knowledge. That is more the domain of philosophy or more precisely what we say epistemology, the theories of knowledge. And there are many theories of knowledge. There’s not just one single concept of what is knowledge. I think there’s far more emphasis should be placed on organisational knowledge. What is organisational knowledge?”* (ZA-02-ITS-DIR-14-KM)

Those in favour to embark in research about the theoretical understanding see currently a misinterpretation of the concept or seek to improve its usability in organisational practice in order:

- To avoid misinterpretation or raise the awareness of the complexity of the subject: *“Yes, absolutely. I mean, from a practitioner point of view, I think we’ve horrible misinterpreted what knowledge is. We’ve been captured by the data information, knowledge pyramid. We need a new understanding of knowledge at a practitioner level, but based on really good thinking from an academic side.”* (CA-03-CPS-EKM-12-BM)
- To reduce confusion: *“There are any concepts which may confuse practitioners (business people), this is why such research is needed mostly according to difference in understanding what knowledge is.”* (PL-03-HE-SL-20-SOC)

- To guide practice: *“Yes, there is a need to undertake research related to the theoretical understanding of ‘knowledge’ to guide an improved way to apply the concept in the organization.”* (BR-08-ITS-CKO-3-BM)
- To increase understanding of the complexity: *“Very much so, because you are going to experience problems in practice if you don’t understand how complex a concept knowledge is and you’re not going to understand why you are experiencing those problems or those barriers to sharing.”* (ZA-06-CG-OB-6-KM)

For research to improve the theoretical understanding of ‘knowledge’ it is *“not so important to find a consensus, but to open new lines of research as a result of the discovery of specific aspects which may be relevant in today’s society”* (ES-04-CPS-EKM-15-BM).

The KM community should exploit views and contributions from other disciplines: *“It would be useful to reconstruct the differences between the different disciplinary views and maybe it converges (. . .)”* (DE-02-ELE-IKM-13-PSY) and *“KM as a managerial applied field might miss a great deal of what is known about knowledge and knowing and cognition in other fields”* (FI-01-HE-PRO-11-KM). The *“integration of many research results is required”* (HU-05-CPS-DIR-14-BM). *“We really need to go to the fundamentals and make alliances with the underlying disciplines of knowledge management. We just need to build more efficient bridges, for example neurologists would be fascinated to see how they can apply their new developments to organizational design and how cognitive researchers could be excited about analysing the kind of processes involve in knowledge markets and so forth”* (MX-01-HE-PRO-23-PSY).

Research needs to address the different aspects such as the dominant dichotomy between explicit and tacit as this academic pointed out: *“And I think there may be ways of doing it better because the relationship between tacit and explicit knowledge is always very problematic and people can’t really sort it out.”* (GB-08-HE-PRO-30-BM). Furthermore, *“we need to reconsider the connectionist view of knowledge. He is not sure he has knowledge on his own. In a way, knowledge only exists when it is shared”* (JP-01-HE-PRO-20-BM).

Research should also re-visit the data – information – knowledge hierarchy *“I don’t think we understand what knowledge is and we still sort of passively define it as a superseded set of data, information, knowledge and then some people add wisdom and then we’re all happy with what does it mean. That doesn’t help a company understand by say matrix of knowledge (. . .)”* (ZA-08-HE-PRO-15-BM) and investigate its limitations and usefulness for research and practice (Tuomi 1999). This need is supported by the review of knowledge in KM Frameworks. About a quarter of frameworks even did not explicitly define knowledge while the remaining 129 frameworks mention a total 29 different knowledge dichotomies (Heisig 2009; Heisig and Orth 2007). Previous studies arrived to similar

conclusions (Hazlett et al. 2005; Grossman 2007), which underlines the urgency to open up this line of inquiry.

## 5 KM Dimensions

Complementary to the open questions in the previous sections B and C, we aimed to elicit the assessments and views from the KM experts regarding core dimensions derived from KM frameworks agreed in Europe (CEN 2004) and Asia (APO 2009) in section D.<sup>3</sup>

About 7 out of 10 KM experts rated the need for future research regarding the **Business Outcome** (D1) of KM as ‘*highly important*’, equally rated is the need for an improved understanding of the **Human and Social factors** (D2) in KM (65 %), followed by research into **Organisational Capabilities** (D5: 57 %). About half of the respondents see it as ‘*highly important*’ to undertake research about **Strategy** (D6: 46 %) and **KM Processes** (D4: 42 %). Finally, a third (all 34 %) regard research into **Technology enablers** (D3: 34 %), **Organisational Environment** (D7) and the **Knowledge Economy & Knowledge Society** (D8) as highly important. While academics and practitioners agree on most of the dimensions, we can observe a larger difference of 11 % regarding the importance of research in **Human and Social factors** (D2) (Table 9).

In the following sections, we will provide a brief overview of the main rationale and topics which emerged from the input of the KM experts.

### 5.1 Business Outcome: D1

Most experts (68 %) agreed that providing evidence for a positive influence of KM onto business outcome is highly important.<sup>4</sup> The main rationale was that without such evidence, KM would not get support from management:

*“KM has to be accepted by leadership as an effective tool to produce results and to reduce risks and not only as a way to retain organizational knowledge. That is the only way KM will be accepted as management tool” BR-03-ECM-IKM-6-NA; “At the end of the day, that’s what it’s all about. If KM does not link to business outcomes, then the whole thing is useless.” CA-07-HE-PRO-18-KM; “A company’s bottom line remains, and will remain, the #1 driver a method or approach that does not deliver to the bottom line does not have a future.” TH-02-CPS-IKM-3-KM*

Experts are also aware that it is a huge challenge to demonstrate the positive influence of KM which is even more challenging if the researcher adopts a view of knowledge interwoven into practice (Gherardi 2006) as this expert states: “*The*

<sup>3</sup> The statistical analysis was undertaken by Peter Heisig (Leeds University Business School, UK).

<sup>4</sup> The first analysis was undertaken by Olunfesi Adekunle Suraj (Lagos State University, Nigeria) and Gregorio Perez Arrau (Universidad de Santiago de Chile, Chile).

**Table 9** Importance of future research in eight dimensions

KM Dimension	Respondents ‘highly important’ (n = 221)		
	Total (%)	Academia (%)	Practitioners (%)
<b>Business outcome</b> – D1	68	72	65
<b>Human and social factors</b> – D2	65	71	60
<b>Organisational capabilities</b> – D5	57	60	54
<b>Strategy</b> – D6	46	46	46
<b>KM processes</b> – D4	42	42	41
<b>Technology enablers</b> – D3	34	34	34
<b>Organisational environment</b> – D7	34	32	35
<b>Knowledge economy &amp; K. society</b> – D8	34	37	32

*point is this, of course that relationship is undeniably important, (. . .) But you can now see that the moment you move to a view that says that, no but, knowledge is interwoven into practice and these things, then your problem is, that can’t demonstrated like that, because it’s mediated through so many things that you can’t demonstrate one-to-one. . .it’s not an unproblematic thing to do, and if you want to do a study like that, that does that, then people would say, you didn’t improve anything here”* ZA-03-HE-SL-13-PHI.

But KM is not the only management approach which faces difficulties to demonstrate its value contribution as one expert reminds “(. . .) *there is no clear formula on the relations between KM effort and organizational values or perceived capabilities. Just like Marketing or CSR functions to an organization, important but no clear indication of the relationship between efforts and value returns.*” (TH-05-ERM-KPM-5-BM)

Practitioners suggest that the outcome should be inclusive and go beyond financial return-on-investment approaches; academia recommends multidimensional approaches recognising the complex reality and longitudinal studies to identify causal relationships, although case studies are the most mentioned (30 %) research approach: “*How to measure the impact of KM on business outcomes? The answer to this question must be developed from a perspective wider than only the economic value of knowledge management.*” CO-06-CON-HKM-4-ENG; “*Multidimensional approaches or models such as the “Balanced Scorecard” allow a better understanding of the complex and multidimensional reality of knowledge processes in the organization. Along these lines, it is important a multidimensional measurement system that expresses the complexity of the intellectual value of the organization (i.e. intellectual capital).*” ES-06-HE-PRO-16-ECO; “*Now we need longitudinal analysis to identify causal relationships as we currently only have correlations. Sure we did regression analysis as well as structural equations which map the plausibility of the model. But what is now really to be done with longitudinal studies if causal relations exist between these factors*” DE-06-HE-PRO-23-BM. A first step towards evidence about the positive



influence of knowledge-related management on performance has been recently shown by a representative survey of businesses ( $n = 2933$ ) in Germany (Pawlowsky and Schmid 2012). A more detailed discussion see also (Perez Arrau et al., 2014).

In summary, KM needs to demonstrate its positive influence on business outcomes in order to gain relevance in practice and academia. While both recognise the challenge of such an endeavour, both agree that the outcome needs a broader understanding (e.g. IC, maturity models) than in financial terms only. Case studies, multidimensional and longitudinal research approaches are suggested.

## 5.2 Human and Social Factors: D2

Human and social factors such as e.g. people, skills, individual capabilities, team capabilities, leadership, incentives, etc., have been assessed by 65 % as an equally 'highly important' future KM research area to business outcome.<sup>5</sup> The dominant rationale is that KM is about people or people are at the centre of KM. This rationale is derived from an understanding of '*knowledge residing in people's minds*', '*people own initial knowledge*', '*people are the source of new knowledge*'.

Emerging is the understanding that '*knowledge exists in the social realm*' (CA-05-CPS-DIR-13-IS) or "*It's highly important, because originally the belief that the intellectual capital sits between the ears, but now we not only know that it is between the ears but also between the people. The formation of intellectual capital results strongly from interactive relations to be explained and understood and therefore such relational and interactive processes are highly important in regard to the generation of new knowledge and the use of existing knowledge.*" (DE-06-HE-PRO-23-BM).

In terms of topics mentioned, we could hardly identify any surprising new themes. Interviewees mentioned as particular important research topics the classical themes such as the influence of culture, trust building, barriers and motivation, incentives for knowledge sharing, recognition, leadership characteristics for KM, social relations among teams, skills and human behaviour for KM, learning, creativity, collaboration and communication, team capabilities, role, skill profile of knowledge manager, etc.

A practitioner believes that KM practice could profit from KM research which integrates the findings from basic research in relate disciplines: "*Beside the research this is highly important. But I think that there is already a lot of research out there in sociology, psychology down to neurobiology. I think that to bring this*

<sup>5</sup> The first analysis was undertaken by Nóra Obermayer-Kovács (University of Pannonia, Hungary) and Anthony Wensley, Max Evans (University of Toronto, Canada).

*together and integrate if for knowledge management or the design of knowledge management. It's highly important seen as the integration of the results from different disciplines.”* (DE-07-AU-HKM-11-ENG)

Personal skills for KM (Heisig and Finke 2003; Reinmann and Eppler 2008) were rarely mentioned by the experts: “(…) *what competences do employees need to have to be able to manage knowledge in the organisation. Which personal competences does a person need for his own knowledge and which competences for the organisation*” (DE-08-HE-PRO-17-BM). Similarly, “*so these are the basic competencies of capturing, storing, sharing and applying knowledge. I think every individual that's a knowledge worker needs to be competent, in other words that they know the best methods, the best tools and the best techniques to do that.*” (GB-04-CPS-DIR-19-CIT)

One aspect which was only mentioned by a single expert is the dimension of power in KM in relation to legitimacy and how power affects what counts as knowledge: “*People have debates, disagreements, and it's about knowledge claims where if I'm arguing with you, I'm basically going to try and discredit your knowledge, you know, and try and legitimise my knowledge. And that's ultimately about power*” (GB-07-HE-SL-13-SOC).

Furthermore research into the potential negative effects in KM is nearly absent in our dataset, with the exception of the notion of information overload by new technologies for KM (e.g. mobile technologies) and negative effects of social media onto social relationships between people. This supports results from previous research claiming a dominance of an optimistic view on KM (Schultze and Leidner 2002).

Another dimension addressed is the influence of new technologies such as social media in regards to knowledge sharing among the younger generation (Generation Y) and with a sceptical view: “(…) *I'm getting worried when I look at children using BBM's and Facebook statuses and Twitter feeds and...it's all one-liner sentences. I'm not sure if we are breeding a generation where they don't have the ability to read 20 or 30 pages and can summarise it in half a page or one page, because they are used to hear things briefly and cryptically and respond cryptically. I don't think we are going to advance knowledge if we don't improve that skills level in terms both writing and interpreting.*” (ZA-02-ITS-DIR-14-KM)

In regards to methodological research designs, the experts articulate a trend towards qualitative research approaches including observational studies, in-depth case studies, action research, but also experimental research designs.

In summary, an optimistic view of KM still dominates, the interviewees do not articulate any novel themes, and KM could profit from systematic review of research results (Tranfield et al. 2003; Denyer et al. 2008) in basic disciplines such as psychology, sociology, organisational behaviour in order to derive research propositions to be tested in further empirical research. Surprisingly, the aspect of power in KM was only mentioned by one single interviewee. Beside addressing the power dimension in regards to knowledge and KM, critical research should focus on the social consequences of KM at the individual, organisational and society level.

### 5.3 Technology Enablers: D3

The technology enablers received the lowest rating with only a third (34 %) of practitioners and academics claiming this field as highly important.<sup>6</sup> Innovation in this area happens mainly in practice outside academia in tech firms as academic research cycles are outpaced by innovation in technologies.

The role of academia is seen in improving the understanding about the limits of technology in KM, supporting making the ‘right’ choice from the multitude of technological options available, helping to implement and operate these applications in organisational practice, and finding the ‘right’ balance between technology and the human dimensions of KM.

In terms of research topics, research questions related to social media and social software stand out. How to make best use of social media tools in organisational settings; investigating the connectedness between employees but also between businesses and customers; what is the value provided by social media; does social media shape the organisational culture; how to protect knowledge captured by open social software and finally the area of personal usage of the ‘right’ mix of applications. These observations complement a research agenda recently suggested by (Von Krogh 2012).

Further themes which emerged were labelled as ‘*consumerisation*’ of knowledge, where capturing and sharing knowledge becomes much easier with the new technologies, but how it could be further optimised remains a research challenge. Another common theme emphasises the role of human factors in terms of behaviour, culture and generational changes. Finally, the redesign of work should be addressed from four main angles, such as the globalisation of the workforce, the increase in mobility and use of mobile technologies for KM, the use of collective intelligence and the increasing interconnectedness of devices. A more detailed discussion see also (Sarka et al., 2014).

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<sup>6</sup>The first analysis was undertaken by Nicholas Caldwell (Suffolk Business School, UK) and Peter Bo Sarka (Technical University of Denmark, Denmark).

In summary, research in technological enablers should also mainly focus on the human side of the application of the new technological tools, its implementation and the consequences of its use and misuse with its current focus on social media and the up-coming technologies under the label of 'big data'.

## 5.4 KM Processes: D4

Research regarding the relationship between KM processes (e.g. identify, create, store, share, apply) and organizational processes (e.g. organizational routines, operational routines, working processes) was rated by 42 % of the experts as highly important.<sup>7</sup>

A first review of the data showed that experts do not agree on the meaning and function of the KM processes, which are a core element of the majority of KM Frameworks (Heisig 2009). Are these processes analytical categories or real organisational processes? Some experts see them as *“the core issue in organizational KM”* (DE-15-HE-PRO-22-POL) or *“Because this is the core of KM”* (IL-07-HE-SL-17-BM). KM processes are regarded as closely linked to organisational processes *“in my opinion, a KM process is an organizational process”* (DE-08-HE-PRO-17-BM), or *“two sides of the same coin”* (PT-07-HE-PRO-10-ECO) which *“(…) must occupy a “natural” space together with other processes considered as an integral part of what must be done”* (ES-04-CPS-EKM-15-BM). Experts regard them as the crucial link where the added value from knowledge is created for the business *“Knowledge has no value if it is not identified and applied in productive processes. This is the key question of KM!”* (FI-03-CPS-NA-32-ENG) and *“(…) where the rubber meets the road.”* (DE-06-HE-PRO-23-BM). Critics see them as *“(…) artificial constructs these knowledge processes. These are the tools of the academic. In the business context they are rather problematic. There we want that people think more about knowledge in the business processes or routines.”* (DE-02-ELE-IKM-13-PSY) or even reject this concepts as *“(…) an old definition”* (GB-10-ERM-HKM-7-NAT) or the *“Wrong model! Focuses on codification and structure. And the granularity’s all wrong. Again what you really want is to look at ecological and biological models and see how we can augment or complement it”* (GB-18-CPS-DIR-20-PHI). Therefore research should clarify the conceptual status and the relationship between these concepts used in KM, management research and organisational studies.

The integration of KM into organizational processes (business processes, working processes, routines, etc.) is the main topic which emerged from our data, confirming previous research (Scholl et al. 2004): *“It is important to integrate KM with other processes to obtain results, as well as to apply KM concepts in the*

<sup>7</sup>The first analysis was undertaken by Peter Heisig (Leeds University Business School, UK) and Aino Kianto (Lappeenranta University of Technology, Finland).

*daily routine of organizations*” (BR-08-ITS-CKO-3-BM); “*KM is still not an essential part of business processes*” (HU-04-ITS-DIR-6-BM); “*How to integrate KM into everyday organizational processes?*” (HK-06-NGO-KPM-5-KM).

Another related main theme should focus on the function of KM processes to enhance organizational processes and (business) outcomes: “(. . .) *there is need to know how knowledge embedded in organisational routines and processes can contribute to organisational productivity.*” (NG-02-MEF-OB-15-BM) “*The key to understand the impact of KM on performance is to look first at possible effects on operations, processes, and capabilities*” (MA-01-HE-PRO-12-BM).

Further research should address KM processes and organizational design, the relations between the single KM processes or KM activities as well as the relation between routine and non-routine processes. Minor topics are complexity approach, decision making, organizational learning, practices and knowledge governance.

In summary, KM research needs to clarify and verify the role of KM processes, and provide answers to questions about their relationship to process concepts and approaches. Design research in KM could provide design propositions to practice about how to integrate these processes into organisational processes or working processes.

## 5.5 Capabilities: D5

Research related to KM and organizational capabilities such as innovation, absorptive capabilities, dynamic capabilities, adaptive capabilities was assessed by 57 % of experts as ‘highly important’.<sup>8</sup> For one expert, this is the future of KM “*That’s from my perspective the most important issue among all. Exactly the prompts you have mentioned here such as innovation, absorptive capacity, dynamic capabilities, etc. Here knowledge management has found a completely new meaning. This is from my point of view the future of KM.*” (DE-04-HE-PRO-15-BM) “*The research will also help KM to gain recognition as a discipline and business strategy in its own right*” (HK-04-CPS-OB-6-LAW). “*Because that would give KM yet again a reason to be, because it is a positive contribution that KM can make, (. . .)*” (ZA-06-CG-OB-6-KM).

Others regard KM as a capability on its own “*Knowledge management is an organizational capability. Therefore, the problem lies in enabling that capability in organizations. Here the human factor is also crucial.*” (CO-06-CON-HKM-4-ENG) or the core of doing KM: “(. . .) *Because, in fact, as I was just saying, really, for advanced industrialized countries, the remainder of what’s left, is, in fact, your*

<sup>8</sup>The first analysis was undertaken by Karina Jensen (NEOMA Business School, Reims Campus, France) and Nekane Aramburu, Josune Sáenz (Deusto Business School, Universidad de Deusto, Spain).

*ability to be innovative, to be dynamically adaptive in a world where you have increased competition, power shifting from the west to the east, great uncertainty. So, in fact, I actually wouldn't draw a distinction between KM and those organizational capabilities. I actually think that is the core of doing KM*" (CA-03-CPS-EKM-12-BM). This argument is based on the understanding that *"Knowledge is the foundation for developing individual and organizational capabilities"* (ES-01-ITS-DIR-14-CTI) and *"knowledge is the material exactly for these things (innovation and renewal capability). Innovation is the product of knowledge."* (FI-03-CPS-NA-32-ENG)

Experts further make the link between knowledge, capabilities and company success while reasoning about future research *"Capabilities are the foundation of company success. Therefore, understanding the role of knowledge management in terms of its contribution to capability development is especially relevant"* (ES-08-HE-PRO-9-BM). *"Organisation that is market active and wants to be innovative, dynamic and adaptive should be able to answer on the market request very fast. That is not possible without efficient KM. Adaptive and flexible internal structuring of organisation is still problematic today"* (HR-06-ITS-DIR-3-IS).

Many experts see KM closely related to innovation: *"KM should be seen as strategy to foster innovation"* (BR-04-GOV-OB-14-OD) including *"(..) the linkages between knowledge-creativity-innovation"* (IN-03-HE-PRO-10-BM), *"(..) innovation is very strictly connected to knowledge somehow and learning processes"* (DK-01-CPS-EKM-18-POL) and *"KM helps drive innovation in the organisation"* (NG-05-ITS-DIR-10-IS). Research should address questions such as *"How to create an innovation culture? How to link creativity (creative process) with new knowledge creation and innovation? How to link creativity with knowledge, innovation and organizational strategy?"* (BR-05-CPS-EKM-14-OD) and *"What is the role of creativity in both Knowledge Management and innovation?"* (CA-02-CPS-EKM-12-IS)

In summary, experts suggest to emphasise research into KM as an organisational capability, which has been previously mainly addressed from an IT systems and organisational learning perspective. A second major research area identified is the relationship between KM and innovation including the role of creativity.

## 5.6 Strategy: D6

Nearly half (46 %) of the experts rated research into company strategy (e.g. vision, mission, strategy process) related to KM as 'highly important'.<sup>9</sup>

<sup>9</sup>The first analysis was undertaken by Rony Dayan (Israel Institute of Technology, Israel) and Florinda Matos, Isabel Miguel (Intellectual Capital Accreditation Association, Portugal).

Future research should improve the understanding of the interplay between KM (strategy) and company strategy to clarify the “*relationship between KM and organizational strategy*” (HU-05-CPS-DIR-14-BM), “*How do organisations employ KM strategy in achieving the organisation’s mission and vision?*” “*What is the role of KM in organisational strategy?*” (NG-03-REM-OB-12-ENG) and “*How KM is placed in a business’s strategy?*” (HK-07-ELE-IKM-1-ENG).

Experts claim that the “*Corporate strategy and KM must be integrated, and KM oriented practice and organization must be designed and implemented.*” (JP-03-ITS-DIR-18-ENG) or “*Alignment of knowledge management strategy with the company strategy*” (KE-04-HE-PRO-9-IS) (BA-01-HE-PRO-12-BM) should be achieved.

In this context, KM research should address instrumental questions such as “*How can knowledge management interventions support organisational strategy and what is the role of KM initiatives in supporting organisational strategy?*” (ZA-06-CG-OB-6-KM); “*How instrumental is KM in the formulation of organisational strategy?*” (PL-04-HE-SR-4-BM); “*How to link KM strategy to company strategy*” (HK-06-NGO-KPM-5-KM); “*How to build a KM strategy that fits with business strategy*” (MA-01-HE-PRO-12-BM); “*(...) identify success factors (vision and mission types) that enable KM approaches to efficiently support strategy realization*” (TH-06-CP-KPM-1-KM). “*How do you articulate the role of knowledge management in the company strategy, in achieving that vision, in executing the mission.*” (GB-17-SER-IKM-11-CIT).

Questions about fit and the link to performance and measurement approaches should be researched: “*(...) To explore the fit between business strategy and KM strategy and to further investigate whether a good fit correlates with a good performance.*” (DE-16-HE-PRO-13-BIS); “*Another important issue is to develop a standardized KM maturity model which will enable managers to measure the maturity of KM concept implementation and to decide upon future KM activities.*” (HR-01-HE-PRO-12-ECO)

Several experts suggested research into the strategy process and the role of knowledge and KM within this process “*(...) knowledge management as an enabler of the strategy process.*” (ES-07-HE-SL-12-BM). In this context the business intelligence is seen as a research area to gather external knowledge to inform strategy: “*I think one topic that people are completely missing is competitive intelligence. We are too much inward looking and too much of our organisational knowledge resources are inward based.*” (ZA-02-ITS-DIR-14-KM). Furthermore, the involvement of staff in the development of strategy is hardly researched: “*(...) but just one or two glimpses of organisations starting to use the knowledge of the entire organisation to help inform strategy, as well as the other side of the coin, which is making sure that internal knowledge management efforts are fully aligned with the existing strategy.*” (GB-01-CPS-EKM-20-GEO) or “*(...) crowdsourcing of strategy.*” (ES-04-CPS-EKM-15-BM). Research could address how the new technologies (Web2.0) could be used to implement strategic management as “*(...) a distributed process. To determine where are dangers lurking; you can’t achieve this with a central supervision department. (...) This was his hypothesis.*”

*This can't be organised in a central manner. From his point of view it is a distributed process which could be organised very well. It will be compacted upwards or sugarcoated so that you cannot criticise the decision makers. And today we have the communication technologies to organise it. If it is done, it's a different question"* (DE-02-ELE-IKM-13-PSY).

In summary, research should further clarify the relationship between organisational strategy and KM strategy including instrumental questions about how to achieve the alignment between both strategies. A second major research strand should focus on the process of strategy development and implementation. Here questions on how new technologies (Web2.0) or direct participation could help to broaden the knowledge base by incorporating a broader range of different stakeholders.

## 5.7 Organisational Environment: D7

Research in the area of KM and the organisational environment (e.g. market, suppliers, government, and legal framework) was regarded by a third (34 %) of the experts as 'highly important'.<sup>10</sup> There is seen a "*lack of research on the impact of context (e.g. organisational environment) on KM*" (BA-01-HE-PRO-12-BM).

Rationales mentioned by experts are that "*KM implementation should consider not only the organization itself but its environment because all knowledge is built in a social and collective way*" (BR-04-GOV-OB-14-OD). "*The relationship between organizations and their environment is knowledge intensive*" (MX-03-HE-PRO-15-BM) in that companies not only exchange goods and services but also customer needs, requirements, customer experiences as well as new ideas as "*creativity comes from outside the organisation*" (AU-01-HE-PRO-17-BIS). Organisations are regarded as 'open systems' and changes in the environment have an impact on the organisation: "*I think it's very important, because organisations are open systems and we are living in a very fast changing environment. So it is extremely important to know what's going on in the external environment and sharing that through your organisation*" (ZA-06-CG-OB-6-KM). Companies which "*become insular and insulated from the outside*" (CA-03-CPS-EKM-12-BM) could get into problems "*also, if the environment is not recognized, organizations are condemned to disappear*" (CO-01-HE-PRO-9-BM). The role of KM is seen as bridging the organisation's boundaries: "*KM is a continuum that includes all performance areas and partners—learning crosses boundaries internally and externally*" (US-02-CPS-EKM-15-KM).

The knowledge exchange along the supply chain is one important research area: "*For companies like us, which relies on a vast network of commercial partners to*

<sup>10</sup>The first analysis was undertaken by Lucia Rodriguez Aceves (Tecnológico de Monterrey, Mexico) and Cosmas Kemboi (KCA University, Nairobi, Kenya).



*ensure to sell the products, this issue is highly important, because we are obligated to perform knowledge management to ensure that our knowledge is transferred to our partners. Similarly, occurs with suppliers, with whom we must establish knowledge management processes to take advantage of the knowledge about raw materials and how to take advantage of the best way. If our partners grow, we grow.*" (CO-06-CON-HKM-4-ENG). The supply chain analogy should be extended towards networks and other stakeholders such as governmental bodies. New technologies and services based on the "(...) cloud principle and aimed to build expertise on regulations to provide it to businesses" (DE-06-HE-PRO-23-BM) could provide insights in knowledge sharing and adoption beyond the classical supply chain paradigm.

It was suggested to use complex adaptive system approaches for future research: "*KM or knowledge governance approach should be based on systems theory and on the vision of the organization as a complex adaptive system, in which the strategy acts as a facilitator to strike a balance with the environment*" (ES-06-HE-PRO-16-ECO). This perspective leads to organisational networks: "*The ecosystem is important, the wider "knowledge ecosystems" or "value networks is interesting*" (FI-01-HE-PRO-11-KM) or "*knowledge ecology*" (JP-06-HE-PRO-33-BM). Some see that "(...) *KM blurs the organisation's boundaries. We need to research how KM enlarges the organisation's boundaries*" (IL-07-HE-SL-17-BM).

The potential boundary-blurring effect of KM links into research on open innovation and the role of knowledge in these innovation approaches: "*I think it's highly important. This goes with the whole theme of open innovation. That is where we want to start sharing knowledge outside of the organisational boundaries. The whole theme and way of thinking on how companies operate is to collaborate nowadays, and that is why knowledge management should follow that way of thinking as well. How do we do it outside of the boundaries?*" (ZA-09-HE-PRO-8-ENG)

A different research theme which should receive increased attention focuses on the public sphere under the concepts of 'knowledge cities' and the 'creative industries': "*I think that the intersection between KM researchers, who are looking at the knowledge cities and the knowledge innovation zones, and (researchers), who are looking at the creative cities and what makes a city "creative", would be useful and important.*" (CA-05-CPS-DIR-13-IS) In particular, this is interesting as one expert claims that "*the socio-cultural context facilitates or inhibits knowledge sharing.*" (PT-07-HE-PRO-10-ECO)

Some experts assessed such research as less important and regard these themes as: "*It's less important. Why? Just way too complicated. (...). So, I think it's just a very complex topic.*" (CA-07-HE-PRO-18-KM) or "*Too complicated and too specific, so I will again say medium to less important. The reason is not that it shouldn't play in there, it will play in there, but that relationship is so complicated, is so networked and is so specific for every company that I think you can't do research on that. You can't generalise anything.*" (ZA-08-HE-PRO-15-BM)

In summary, the study shows that KM reaches beyond organisational boundaries and organisations should be conceptualised as open adaptive systems. Future research should use the concept of a knowledge supply chain, which includes also public institutions and external knowledge via open innovation. A third research strand suggested should address KM on a local and regional level for “knowledge cities” or “knowledge clusters”.

## 5.8 Knowledge Society and Knowledge Economy: D9

Research around issues emerging from KM within the knowledge economy or knowledge society received the lowest rating with 34 %.<sup>11</sup> Experts who regard KM an activity on the organisational level only, did not comment on this dimension, while others see “*KM is a child of the emerging knowledge economy AND knowledge society*” (DE-15-HE-PRO-22-POL).

Experts from non-OECD countries suggested investigating knowledge-based development by referring to failures of development efforts based on natural resources (e.g. petroleum) alone as “*development has not been sustainable due to lack of knowledge ground*” (CL-03-ERM-HKM-5-ECO). “*Knowledge management has an important role in countries development. We need to follow good examples like Korea, a country that in the past made huge changes to develop a knowledge-based economy and today is a great example to countries like Colombia*” (CO-06-CON-HKM-4-ENG). “*What challenges bring these new K. Societies and economies and how can they be overcome?*” (TH-04-CPS-DIR-NA-KM). “*What is the role of KM in preserving societal Culture, Tradition and Languages? To what extent do we manage knowledge for the growth of the economy and for the sustainability of the society?*” (NG-04-TEL-IKM-12-NA)

Some experts reflected on the appropriateness of current national education systems to provide the right skill sets and competencies for society: “*(...) So, that kind of command and control culture combined with that analytical deductive standard approach, I think is limiting our ability for our people to be creative and to come up with new integrations across multiple domains to solve complex problems.*” (CA-03-CPS-EKM-12-BM) “*We need to research more on the topic around education to achieve a social economy. Social economy, if organisations transform to social business, change communication, motivation, want new competences from their employees, media competences, this is not only done in organisations, but also happens private*” (DE-13-ITS-EKM-17-NAT). “*Another issue is informal learning and lifelong learning. (...) There exist learning passes, e.g. in France, that proof social commitment and what you learned from it, what*

<sup>11</sup> The first analysis was undertaken by Fábio Ferreira Batista (Instituto de Pesquisa Econômica Aplicada, Brasília, Brazil) and Mariza Tsakalerou (The Hong Kong Polytechnic University, Hong Kong).

*capabilities you gained*" (DE-17-ERM-IKM-15-ENG). "How can we improve knowledge acquisition as low cost for the masses? How do we make our citizens educated consumers?" (US-01-GOV-IKM-19-ARC). Finally, "What are the skills of the knowledge economy?" (KE-02-HE-SR-3-IS)

Political sciences should get involved to research how governments and policy-makers could stimulate knowledge creation: "What can policy-makers, whether that's the mayor and council or the governor or the head of a province or the head of a country, what initiatives and things can be initiated through policy to stimulate the knowledge cycle, the creation of good knowledge, better education, the transfer of knowledge between academic institutions and researchers and those that can put this to good use" (CA-05-CPS-DIR-13-IS). But also how governmental institutions make use of knowledge: "(...) maybe the KM and Politics – How does politics use knowledge? The General Audits Office which controls the government and expenditure, but what's about knowledge. Knowledge auditing of governmental organizations?" (DE-03-HE-PRO-22-PHI)

In OCED countries like Germany it is about shaping the political agenda where thinking "is still strongly framed by thinking of a high-tech machinery industries such as automotive, machine tools, chemical industries, etc. But the logic of these industries is not necessarily a knowledge-intensive logic. (...) in the political sphere this topic is only addressed in combination with technology, in combination with something," While "you can observe it in Finland, several countries in Asia where the knowledge dimension is part of the political agenda. An independent topic intellectual capital as resource of the country is not yet affine with the political culture and political decision making processes" (DE-06-HE-PRO-23-BM). "How do measure the intellectual wealth of a knowledge society?" (NG-02-MEF-OB-15-BM). Therefore, could intellectual capital become a category for accounting the wealth of nations?

Some experts referred to social issues such as the democratization of knowledge and the implications for ownership and the economy: "(...) in today's world more people know more things than ever before in human history, and that has huge implications for society" (GB-12-HE-PRO-12-BM) addressing questions such as "Internet – who owns the content of the internet? versus Open Content and Open Source Movement" (DE-03-HE-PRO-22-PHI). "The open source economy" (IL-04-HE-SL-12-BM).

The openness of different (national) cultures and political freedom required for the knowledge society were other aspects that future research should address: "There's a knowledge society that presupposes a kind of openness. We have many societies today that are still pretty backward and culturally, where people don't have freedom of expression – things that are needed for there to be a thriving free flow of ideas and creativity" (CA-08-CPS-DIR-13-BM). But also critical elements such as privacy issues: "Or knowledge use in health care, addressing privacy issues, the transparent patient." (DE-03-HE-PRO-22-PHI)

In summary, experts regard relevant research about the knowledge-based development and the role of the formal and informal educational sector to provide the “right” skills for the knowledge society. The role and use of knowledge in the political system by governments should be addressed. Social aspects related to open content such as democratisation of knowledge, cultural openness, political freedom and consequences for privacy are valuable research topics. Finally, does the knowledge economy require new measures of wealth such as a national intellectual capital index?

## 5.9 KM Education: E

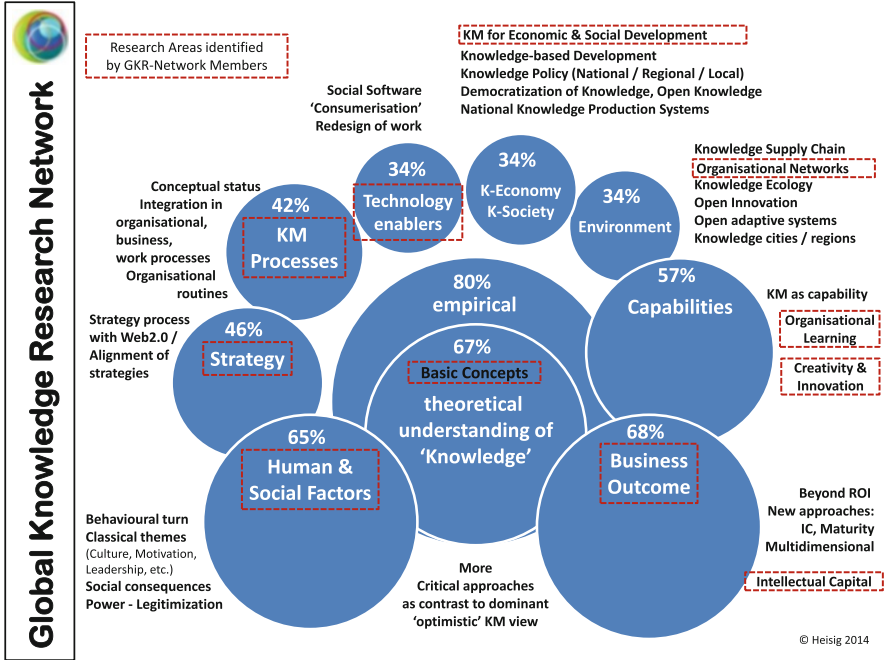
Section E addressed the topic of KM education by asking about the importance of KM teaching, the level of teaching (e.g. academic or non-academic courses) and the disciplines where KM should be taught. Nine out of ten experts from academia and practice stated that “systematic instruction to KM” is ‘highly important’ (53.1 %; 78) and ‘important’ (37.4 %; 55) while only one single expert claimed that it is ‘not important’. KM Teaching should be part of teaching on Master (70 %; 106) and Undergraduate level (47 %; 71). At the current moment (2012–13) KM should be delivered as part of established programs (53 %; 81) at university and less by specialised training providers (20 %; 31). KM is predominately seen as part of Business Management courses but it was suggested by practitioners (GB-19-CP-OB-3-NAT) to teach the basics to students in Natural Sciences, Law and Medicine.

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## 6 Future Research About Knowledge Management

Over the last two decades, the knowledge management discipline has become enriched with a huge wealth of contributions from a multitude of scholars and an extensive accumulation of experiences in organisational practice in nearly all economic sectors and societies around the world. The multidisciplinary character of KM contributes, in our view, to the lack of agreement on the fundamentals with different paradigms in the field and it is not a characteristic of a “pre-science” state of the KM discipline as others have claimed (Hazlett et al. 2005). Still this multidisciplinaryity creates another challenge as one expert put it, that “*Knowledge Management has not yet a proper home, (...)*” (GB-01-CPS-EKM-20-GEO). Nevertheless, KM is progressing towards becoming a reference discipline (Serenko and Bontis 2013b).

Our research indicates (Fig. 2) that the KM community should re-visit some fundamentals such as the understanding of the concept of knowledge. Research should also clarify and verify the concept of the KM processes which have become



**Fig. 2** Importance of future research and selected research themes

a standard element in KM frameworks around the world in academia (Heisig 2009) and practice (CEN 2004; APO 2009). In this context, KM research should also explore ecological and biological models. The question of how to integrate KM into business and organisational processes still awaits a satisfactory answer (Scholl et al. 2004). Another research strand to be emphasised is the conceptualisation of KM as an organisational capability taking advantage of rich research about (adaptive, absorptive, dynamic) capabilities in management and organizational studies. The role of KM in innovation including the relationship with creativity is another important research area derived from the expert views of our sample.

A KM capability approach might also help to address the challenge, shared with other disciplines (e.g. HRM see (Prowse and Prowse 2010), IT: see (Dedrick et al. 2003)), regarding the value contribution of KM. Academics and practitioners agree that such research should understand the added value by KM beyond pure financial indicators, exploring new concepts such as intellectual capital or maturity frameworks. Still, it will be a difficult challenge to identify the value contribution of KM within systemic and dynamic organizational settings. The wealth of practical KM experiences in different economic sectors and in several countries could ease this challenge. KM should employ meta-analysis of existing research and undertake multiple case studies in order to advance the understanding regarding the value contribution of KM.

But how can KM shake off the image problems of the dominant information systems view, caused by its overselling by vendors and consultants in the 1990s

(Martin 2008), if the only consensus among the participants in our study is that a certain technology (today: social software) was regarded as an advancement of the KM field? However, the research suggested in this regard places clear emphasis on the economic, organisational and human context factors related to the implementation and use of these new technologies. This underlines the urgency of the shared view of the KM community to invest in human and social factors research in KM.

Therefore, KM research requires a behavioural turn. Relevant research in the root disciplines of KM such as psychology, behavioural sciences, sociology should be systematically reviewed to develop research propositions for academic studies and design propositions to test in organisational practice (Denyer et al. 2008; Van Aken 2004; Van Aken and Romme 2009). Furthermore, KM research should adopt more critical research perspectives to explore themes such as power, stress and the impact of KM on individuals and social relations. This research could help to balance the still dominant optimistic view of KM (Schultze and Leidner 2002).

Research into strategy should pursue two main strands. The role of KM and the relationship between organisational strategy and KM strategy require further investigation, including instrumental questions about their alignment. Secondly, research should concentrate on the strategy process as such and improve the understanding of the role of knowledge and KM in this process and explore the potentials of the new technologies (e.g. social software, Web2.0) and modes of direct interactions ('knowledge café') to involve a broader range of expertise from internal and external stakeholders.

Organisations are understood as 'open systems' and form part of networks with different partners in supply chains and stakeholders in society. The concept of a "*knowledge supply chain*" (ZA-05-ITS-DIR-32-ENG) has only been applied in the IT outsourcing context (Cha et al. 2008) and further research into the role of knowledge and KM in the supply chain (Samuel et al. 2011) would be a valuable endeavour. The organisational network perspective should also include public agents and undertake research at the local and regional (cluster) level with a focus on "*knowledge cities*" or "*knowledge regions*" as suggested by experts from our sample.

On a macroeconomic and societal level, future research themes should address the role of knowledge for economic and social development, emphasising the knowledge-based development view. The experts in our sample mainly mentioned the education sector and informal training and skill development as sources for building human capital in the knowledge society. But which skills and competences are needed and how and where are they produced remain open questions.

Economists, sociologists and political scientists have used the concept of national production systems or 'national innovation system' (Lundvall et al. 2002) to describe and explain economic development. While tacit knowledge has been recognised in these approaches, the role of KM has hardly been explored in this context. Can a macro perspective of KM employ a concept like a 'national knowledge production system' to describe the knowledge creation and consumption on a national level? And how should we measure the outcome? Could a national intellectual capital index become a category for accounting for the wealth of nations?

Some experts referred to social issues as future research strands, such as the ‘democratization of knowledge’, proliferation and influence of open source knowledge, different cultural levels of openness and national freedom influencing knowledge sharing and innovation as further research topics.

Finally, the experts rarely mentioned the need for a “*knowledge policy*” (Stehr 2003a, b). But, how could governments and policy-makers stimulate knowledge creation? And should governmental organizations be audited not only in regards of the proper use of public funds, but also regarding the use of the best available (international) knowledge? (Fig. 2).

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## 7 Feedback and Limitations

Many participants from academia and practice welcomed our initiative. Our explorative approach with the data gathering instrument containing broad open questions was criticised by some academic colleagues as “*too broad*” (DE-15-HE-PRO-22-POL). Some participants found the questionnaire too long. The eight KM dimensions (D1–D8) derived from KM frameworks to structure the conversation were regarded as ‘*not enough theory-driven*’ which lead some academics to decline sharing their latest views about the KM field with this research initiative.

Our research approach has its limitations due to the sample of scholars and practitioners the partners were able to involve given the resources and availability. Still we believe that the sample reflects the main academic disciplines of KM research (Serenko and Bontis 2013a, b) and main sectors involved in KM practice. Furthermore, two thirds of our experts have at least 10 years professional experiences in the KM field and therefore would be able to assess the developments from their perspectives.

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## 8 Outlook

This chapter provided a first overview of the results from the Global Knowledge Research Network study about advances, challenges and future research needs around knowledge and KM. However, much more analysis needs to be done to exploit the rich dataset accumulated.

The next step is to undertake further analysis of the qualitative data in order to explore differences among selected segments of experts and topics suggested. Secondly, we will undertake literature reviews for the different topics we addressed in our instrument and contrast the state of the art with our empirical material to derive additional future research questions. Finally, we would like to repeat cyclically this research in the future.

The research strands outlined above are only a few themes, which the members of the Global Knowledge Research Network were able to derive from the data input received from 222 experts from 38 countries. More detailed research will further propose additional themes and questions to be addressed by the large community of KM researchers and KM practitioners.

The input received from around the world shows that KM research has still to address a multitude of interesting themes within interdisciplinary research projects. KM research should take advantage to exploit research results in related disciplines and aim to contribute to the discussions in established research outlets. The close collaboration with KM practitioners should be intensified in order to provide rigours and relevant research for academia and practice (Mohrman et al. 2002; Mohrman and Lawler 2011).

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B – KM Practice	Aldu Cornelissen (University of Stellenbosch, South Africa) and Ernesto Amaru Galvis Lista (Universidad Nacional de Colombia, Bogotá, Colombia)
C – Core Concepts	Joanna Paliszkievicz, Magdalena Madra (Warsaw University of Life Sciences, Poland) and Nasser Fathi Easa (Alexandria University, Egypt)
D1 – Business Outcome	Olunifesi Adekunle Suraj (Lagos State University, Nigeria) and Gregorio Perez Arrau (Universidad de Santiago de Chile, Chile)
D2 – Human and Social Factors	Nóra Obermayer-Kovács (University of Pannonia, Hungary) and Anthony Wensley, Max Evans (University of Toronto, Canada)
D3 – Technological Enablers	Nicholas Caldwell (Suffolk Business School, UK) and Peter Bo Sarka (Technical University of Denmark, Denmark)
D4 – KM Processes	Peter Heisig (Leeds University Business School, UK) and Aino Kianto (Lappeenranta University of Technology, Finland)
D5 – Capabilities	Karina Jensen (NEOMA Business School, Reims Campus, France) and Nekane Aramburu, Josune Sáenz (Deusto Business School, Universidad de Deusto, Spain)
D6 – Strategy	Rony Dayan (Israel Institute of Technology, Israel) and Florinda Matos, Isabel Miguel (Intellectual Capital Accreditation Association, Portugal)
D7 – Environment	Lucia Rodriguez Aceves (Tecnológico de Monterrey, Mexico) and Cosmas Kemboi (KCA University, Nairobi, Kenya)
D8 – Knowledge Economy	Fábio Ferreira Batista (Instituto de Pesquisa Econômica Aplicada, Brasília, Brazil) and Mariza Tsakalerou (The Hong Kong Polytechnic University, Hong Kong)



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## Annex: Coding Schema for Experts

### DE-01-HE-PRO-15-ECO

A coding schema for each interview partner was designed consisting of the following:

**DE** = Germany – Country working in

**01** = Number of interview per country

**HE** = Higher Education – Industry

**PRO** = Professor – Role of the interviewee

**15** = years of KM experiences (longest if two were given)

**ECO** = Economics – Academic: Discipline doing research/ Industry: Discipline educated in

Country (ISO 3166)	Industry	Role	Education/discipline
AT – Austria	AE – Aerospace Industry	CKO – Chief Knowledge Officer	ARC – Architecture
BA – Bosnia & Herz	AU – Automotive Industry	KPM – Knowledge Program Manager	BM – Business & Management Research, Accounting
BR – Brazil	BIF – Banking, Insurance and Financial Services	HKM – Head of Knowledge Management	CIT – Computer Sciences & Information Technology
CA – Canada	CO – Construction	IKM – Internal KM Consultant	<b>ECO</b> – Economics
CH – Switzerland	CPS – Consulting and Professional Services	EKM – External KM Consultant	ENG – Engineering
CL – Chile	CG – Consumer Goods	DIR – Director, Manager	GEO – Geology
CO – Colombia	CP – Chemical and Pharmaceutical	OB – Other Business role	IS – Information Science, Library Science
DK – Denmark	ITS – IT and Software	<b>PRO</b> – Professor	KM – Knowledge Management
EG – Egypt	ELE – Electric Industry	SL – Senior Lecturer/Lecturer	PHI – Philosophy
ES – Spain	ERM – Energy and Raw materials	SR – Senior Researcher	NAT – Natural Sciences, Physics, Chemistry, Biology

(continued)

Country (ISO 3166)	Industry	Role	Education/discipline
ET – Ethiopia	ECM – Engineering, Capital Equipment and Metal	OA = Other role academia	PSY – Psychology, Behavioural Science
FI – Finland	FA – Food and Agriculture		SOC – Sociology
FR – France	GOV – Government Administration		POL – Political Sciences
DE – Germany	HE – Higher Education, University		LAW – Law
GB – Great Britain	MEF – Media & Film		HLA – Humanities, Languages, Art
HK – Hong Kong	PWC – Paper, Wood, Glass, Ceramics		OD – Other Discipline
HR – Croatia	TEL – Telecommunications		
HU – Hungary	TCF – Textile, Clothing, Shoes, Fashion		
IE – Ireland			
IN – India			
IL – Israel	TRA – Trading		
JP – Japan	TRT – Transport and Tourism		
KE – Kenya			
LK – Sri Lanka	SER – Services		
MA – Morocco	OTI – Other Industry		
MX – Mexico	NA – No answer		
NG – Nigeria			
PL – Poland			
PT – Portugal			
RI – Indonesia			
SE – Sweden			
TH – Thailand			
TT – Trinidad & Tobago			
US – United States			
UY – Uruguay			
ZA – South Africa			

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# What Practitioners (Should) Want and Expect: A Personal Perspective

Helen Hasan

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## 1 Introduction

There is no doubt that the practice of Knowledge Management (KM) can be of great benefit to organisations. However, in facing the complexities of the changing global environment, KM is rarely easy or straight forward. It has been, and will no doubt continue to be, a challenge to do KM well even by seasoned practitioners. This is where research comes in. The KM body of knowledge will only grow if there is mutual respect and cross-fertilisation between research and practice.

This chapter attempts to speculate on what practitioners expect and want with respect to KM now and into the future. This challenge cannot be met in the same way that one would study the present or the past, as one of the basic tenets of complexity theory (Mitleton-Kelly 2005) is the virtual unknowability of the future. I will therefore approach the challenge from my interpretation of the complexities of KM in the past and present together with some insights expressed by some of my practitioner colleagues. I assert that all aspects of KM must be understood within their context. I therefore embed my interpretation of KM past, present and future in the context of my own substantial experiences.

I should make it clear from the start that I have only limited experience as a KM practitioner. So I am not writing this as a representative of the KM practitioner community but rather as a KM researcher who has observed, and occasionally indulged in, KM practice for many years. I have conducted a few paid KM consulting jobs, which I will refer to later. It was however when I spent 5 years on the committee which developed the Australian KM Standard that I came into contact with a great many KM practitioners from whom I have learnt, and continue to learn, much. I am very grateful that they have been happy to share their ideas and experiences with me. I enjoy following their online comments on Twitter and the

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ActKM list and occasionally meeting them at KM conferences and events. Many people who work professionally as KM practitioners also work as part-time lecturers and tutors. Some have also undertaken post-graduate study in KM.

KM is clearly an area where there is a porous and blurred boundary between academia and practice. As in every profession there are occasions where practitioners accuse academics of being out of touch while academics claim that practitioners ignore well-researched findings. My experience is that in the field of KM there is a good deal of respect between the two communities. Academic research looks for basic principles, with long-term stable characteristic and relationships, while practitioners want specific solutions in order to solve immediate problems and meet current organisational objectives within budget and with allocated resources.

In research and practice KM is rarely easy, dealing with change, risk and complex issues in diverse contexts. In most cases it is difficult to attribute organisational outcomes directly to KM initiatives. It is therefore essential that academics and practitioners cooperate in advancing the field into the future. In this chapter “[Knowledge Management: Origins, History, and Development](#)” present a picture of the past present and future of KM from what I see as the practitioner perspective.

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## 2 Background

Before attempting to look towards the future, I think it only proper to see where the KM practitioner community has come from and where it now finds itself. Although there has been much debate over exactly what KM is, one thing is certain, that KM practice is always context dependent. What works in one context may not work, or works differently, in another. Therefore I begin by setting the context for this essay on what KM practitioners want and expect from the future.

For many of us, the first exposure to the ideas of KM was through the published work of Nonaka and others in the mid to late 1990s (Nonaka 1994). In my case, I was undertaking a PhD at that time on the effect of Executive Information Systems (EIS) on the process of strategic decision-making in organizations. EIS were quite new at the time and were in many ways quite revolutionary. They relied on data-warehouses that pulled data from properly normalized organizational databases, cleaned it, and then restructured it into aggregated data in denormalised, multi-dimensional databases with interfaces that actually made sense to senior managers. IT and database professionals had been taught that a good database was normalised according to entity-relationship models that reflected the way business was transacted. A different structure was required for strategic decision making and this challenged the firmly held principles of good database design. As a result EIS were often viewed by the IT technical support staff as not legitimately part of their responsibility.

On the other hand, executives immediately recognised the potential of such tools. They had previously viewed computers as glorified typewriters that did not

belong on an executive's desk. Now they had an application that they could use directly to know how the business was performing. They could set up and track key performance indicators and have a more authoritative source of information on which to base and justify decisions.

Distinguishing these EIS from the transactional organizational information systems coincided with a trend to emphasise *knowledge* rather than *information* as the most critical organisational resource. Both managers and researchers in management science started talking about the knowledge-based view (KBV) of the firm as a special case of the resource-based view (RBV). In popular parlance the *Knowledge Age* superseded the *Information Age* and new terms such as the 'knowledge economy' became part of the public discourse.

My PhD research investigated the implication of this new focus on knowledge rather than information as the basis of strategic decision-making. I found that in this context the activity of sense-making was central to the relationship between information, knowledge and decision-making (Hasan and Gould 2001). My basic premise was that executive information systems were a new tool for presenting organisational information to senior managers that would improve their knowledge about what was happening. The way they made sense of the information presented through graphical direct-manipulation interfaces would impact on their decision-making leading to action.

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### 3 Lessons on KM Practice from the Creation of the Australian KM Standard

Just as I graduated with a PhD in 2000, Standards Australia became interested in KM. They commissioned a study of what was happening locally in terms of KM both in practice and in academia. An original KM Framework (Fig. 1) was produced and explained in a Handbook published by Standards Australia (HB275-2001). The Handbook was well received by practitioners and its popularity led Standards to set up a committee to develop a full KM Standard.

Among members of the KM Standard committee were people, mostly practitioners, from Records Management, Human Resources, Project Management and other corporate services. I was surprised to be the only IT person, and most of the time, the only academic. In academia the concept of KM is used in the fields of Computer Science and Information Systems. It is not my view of KM, but I know people in Computer Science who use the phrase managing knowledge to refer to methods and software tools in areas of semantic models, ontologies, data mining big data and business analytics. While my main field of research is Information Systems (IS) I officially represented the Human Computer-Interaction (HCI) community on the KM Standard committee. HCI and IS are closely related. Both are concerned with the human use and impact of ICT. I don't believe it is a co-incidence that KM emerged in the mid-1990s just as the Internet was taking off. As an IS person, and one who relies on Complexity Theory to deal with complex systems, I see the Internet, or more correctly the World-Wide Web that





**Fig. 1** A visualisation of the knowledge eco-system from the Australian KM standard (AS5037-2005)

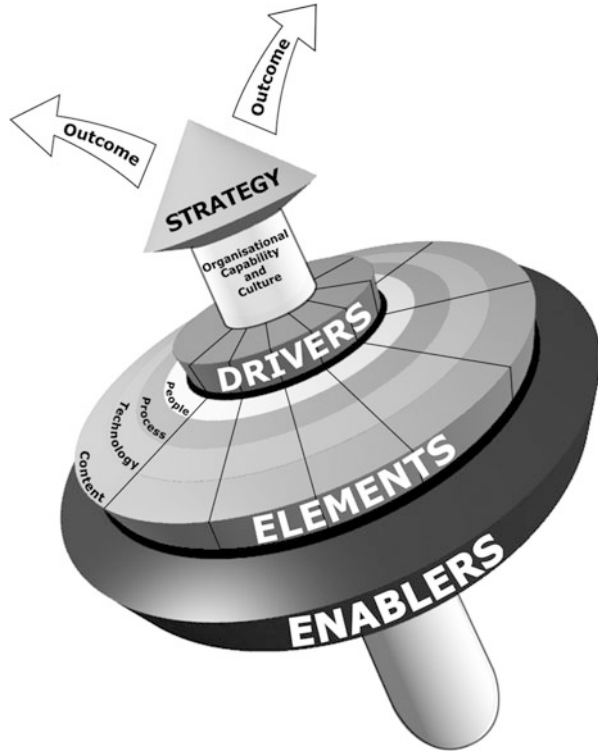
sits on the Internet, as the world's biggest "information system". I describe it as a global complex adaptive system that connects everyone 24/7 and is continually evolving, providing exciting possibilities for sharing and co-creating knowledge that we still don't really understand or manage very well.

The Australian Interim KM Standard, produced and released in 2003 (AS5037 (Int-2003)) was in many ways similar to the Handbook in that it was based on a rather prescriptive mechanistic framework (Fig. 2) showing that application of elements of KM lead to beneficial strategic organisational outcomes. It was widely circulated for evaluation by the practitioner and academic communities. While a great deal of positive feedback was received, there were three major challenges identified, namely (1) establishing an acceptable scope and content of KM, (2) establishing the link between KM initiatives and beneficial organisational outcomes and (3) building the case for the value of KM even when its benefits are not directly measurable or directly linked to outcomes but rather creating a culture for innovation that will benefit the organisation down the track.

To help address item (1) an accompanying KM vocabulary was created (HB189-2004). In an attempt to address item (2) the Final Standard released in 2005 (AS5037-2005) contained a KM maturity model (Fig. 3) that allowed organisations to identify where they currently were, and where they might apply KM initiatives in order to improve performance in respect of the four elements of People, Process, Technology and Content.

The Final Standard (AS5037-2005) was far less prescriptive than the Interim Standard and does not dictate what any particular organisation should do. It attempts to present a view of KM that was appropriate for the increasing complex environment of modern organisations. It recognised that Km initiatives are usually complicated by the need to manage of collections of people, processes,

**Fig. 2** The KM model from the interim standard (AS5037 (Int-2003))



technologies and content from many different organisational units. As shown in Fig. 4, the Standard replaced the mechanistic view of KM presented in Handbook and Interim Standard with a much more organic one, which portrayed KM as operating as a knowledge eco-system.

The Standard provides a three-phase cyclic framework (Mapping, Building and Operationalising – Fig. 5) for planning and implementing in a non-linear cyclic set of three phases as follows:

- *Mapping*: an audit of the current organisational KM state in the local context and culture and identifying suitable KM goals
- *Building: experiences and linkages*: this is the vital phase of prototyping, trialling projects, building trust, generating champions.
- *Operationalising: initiatives and capabilities*: including determination of effectiveness, measurements and performance evaluations.

The building phase in particular recommends appropriate knowledge interventions allowing participants to explore and take ownership of emergent solutions. A range of possible enablers are described that could support the explorations and interventions according to the demands and needs of a particular organisational circumstance.

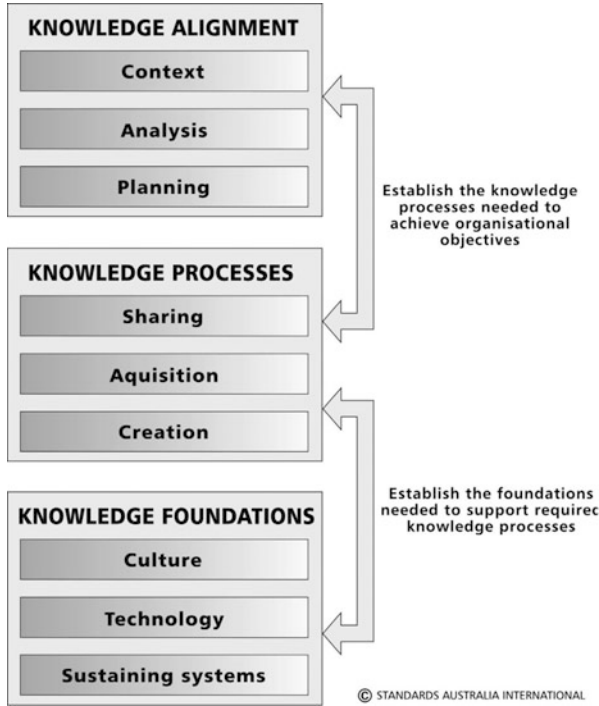
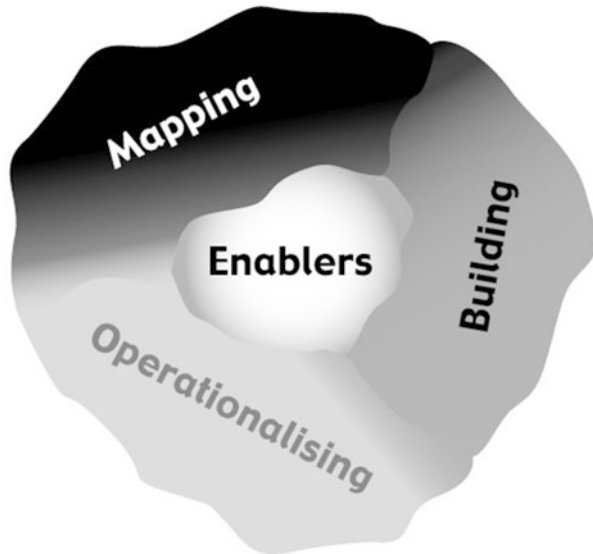


Fig. 3 The knowledge management framework from the handbook (HB275-2001)

Elements	Standalone	Connected	Networked	Adaptive
People	Individualised work functions Autonomous decision making Hierarchical structures	People work in groups or teams Sharing information is part of normal work activity Trust is developed through both formal and informal work interactions and activities Networking allows the development of shared understandings	Cross functional teams work together Trust is developed through both formal and informal work interactions and activities	Embrace change as a normal state High situational awareness High levels of trust
Process	No standard processes Knowledge activities not rewarded High levels of duplication Mistakes are hidden	Knowledge is contained in objects Processes are documented and standardised Duplication is identified and reduced	Continuous improvement Senior management embrace knowledge management Knowledge is a flow	Mistakes viewed as learning opportunities
Technology	Non-existent Information held on individual computers Lack of standards for interoperability Independent legacy systems	email Limited use of intranets Shared drives	e-business Collaborative tools, groupware Interoperability standards for hardware and software Customer relationship management Enterprise portals	Sophisticated extranets Sophisticated intelligent search engines
Content	Messy chaotic and unstructured Ad hoc and in silos Independent pools of information held locally	Document and record management systems Decentralised and trained authors for intranet Ad hoc codification of knowledge Some content available on intranet	Integrated sharing of content with suppliers and customers	Easy access to information

Fig. 4 The maturity model of the Australian KM standard (AS5037-2005)

**Fig. 5** The process of KM from the Australian KM standard (AS5037-2005) – not a prescriptive, universal, linear KM process but rather a cyclic set of three phases



The Australian Government Information Management Office was a strong supporter of the final standard and used it to develop a checklist (AGIMO 2004) that was widely used in the Australian public service. The description of KM in this document remains relevant for public sector organisations today.

Knowledge management (KM) builds on earlier approaches of data management and information management and adds a higher level of complexity with the inclusion of meaning, networking, collaboration and business process improvement. KM has also emerged as an inter-disciplinary framework to assist organisations to engage in the wider information/knowledge economy. Technology is only one element in this engagement; content, process and people aspects also need to be considered. The information economy has a strong focus on networks, which requires organisations to focus on knowledge creation, values, ethics and cultural drivers to optimise the use of their knowledge resources. Public sector agencies throughout the world are at the forefront of implementing KM. Closer citizen engagement, cross-agency collaboration and efficiency dividends are driving agencies to adopt initiatives that focus on making the best use of knowledge within them. While many organisations may not use the term ‘knowledge management’ to describe their activities in this area, many relevant activities are undertaken to enhance organisational learning, improve service delivery, and build capabilities and flexibility. (AGIMOS 2004, p. 3)

Since its release, the Standard has, apart from the AGIMO report, received a rather cool reception from most practitioners. It does not contain an easy to follow recipe for KM or dictate how the success of KM can be measured so takes some effort to implement in any particular context. On the other hand, many of those who know that there is no simple recipe for KM have not realised that the final version of the Final Standard, unlike the Handbook and Interim Standard, does not take such an approach. It came as quite a surprise when I read that Burford and Ferguson

(2011) viewed the knowledge ecosystem of Fig. 4 as being “too neat” when I know that it was created in order to depict its messy organic nature.

Getting the final document approved by the standard’s authority was such a battle that members of the committee who developed it went on to do other things once it was approved. There continues to be debate on whether a KM standard is appropriate, meaningful, or even possible. However, despite all these things I believe that the process of developing the Australian KM Standard and the resulting Standard itself have been of value to the KM community. Over time, it was picked up by some people who found it interesting and useful. As Burford and Ferguson (2011) observed many Knowledge Managers have used the authority that comes with a Standard to support their KM endeavours. I still recommend it as an introduction to KM for anyone confused by the essentially messy nature of KM and believe that much of it is still relevant.

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## 4 Current KM Practice

So where is KM practice now? The KM practitioners whose views I seek out and respect have been doing KM for many years. They form a dedicated community of seasoned KMers albeit with different skills and approaches. They survive and prosper not only because a great deal of their professional lives are invested in KM but also because they appreciate how KM can be organisationally valuable and personally rewarding, despite the challenges encountered. As one of them expressed it, “there are a number of practitioners who are quietly getting on with the job of doing KM within their organisation, but it’s pretty submerged”. The view of another was that KM is “basically a support function in most organisations, and not necessarily an essential one; viewed as a ‘nice to have’ by many executives. We need Finance because how else do the bills get paid, we need HR because we have to employ staff, we need IT to keep the email switched on. But KM? Where is the value?” Another colleague expressed the view that “KM is in a really interesting space at the moment, because it’s no longer “the hot thing” as it was in the late 1990s/2000s”. There was a time when KM was new, flashy, flavor of the month and something every organization had to have. It was subsequently described as a passing fad but it has quite rightly survived but is now more embedded in organizational structures, technologies and processes.

While those ‘in the know’ recognise and value KM, outside this inner circle KM can still be somewhat of a mystery. In a global study conducted just a few years ago, Patrick Lambe (2008) found the life of most Knowledge Managers was “nasty, brutish and short”. The results of the study showed that the vast majority of people taken on to do KM in organisations had little prior experience, hardly any relevant qualifications and received little on-the-job training. They reported that KM awareness and support was severely lacking in most organisations and it seemed that this situation was worst in the more advanced economies.

I suspect that the situation may have improved since Patrick did this study but probably not by much. I have heard many stories of how KM roles in organisations

are established basically by accident. An executive may read about a KM initiative in a management magazine or at a conference. Alternatively a specific problem arises that is seen as a KM issue (e.g. retirement of several senior people taking knowledge out the door). A position is set up and someone in IT or HR given the job or a new position is advertised with vague criteria, it gets variety of applicants and someone with little KM experience is appointed.

Large organisations often have someone in the position of Chief Knowledge Officer (CKO), whom Wikipedia currently describes, not very helpfully as someone “responsible for ensuring that the organization maximizes the value it achieves through knowledge”. The most insightful description of the CKO role that I have seen came many years ago from Earl and Scott (1999). From a study of 20 CKOs they proposed that the CKO be a direct appointment of the CEO, have been in the organisation at least 10 years but not be too close to retirement and have a roving commission but not a large budget. Such CKOs would pick up good ideas, identify potential KM initiatives, promote knowledge sharing and act as change agents.

There is no getting away from the fact that KM is by its very nature hard to pin down, difficult to define, covers a diversity of things and its effects are hard to measure. KM can be seen something related to technology such as maintaining knowledge repositories, document management systems and Intranets. Alternatively it can be seen something associated with the human capital related to staff training, appointment of staff with certain expertise, managing exit interviews such or scanning for relevant external information to be circulated within the organisation. In one consultancy job I undertook, the Knowledge Manager I interviewed saw a key part of her job as spreading her knowledge throughout the organisation and so would write a weekly ‘fact sheet’ that she distributed. Not surprisingly, it was not often read or applied but she felt she was doing her job. Several of my consulting jobs have involved attempts to democratise organisational knowledge using a corporate wiki. Although not always successful, these projects promoted the idea that all members of an organisation were knowledge worker and what they knew was valuable to others in the organisations. Contributors to a wiki not only added content of their own, they can edit and comment on content entered by others and even decide on how the whole knowledge repository can be structured. All in all, there is great variety among KM practitioners, their backgrounds and skills, the organizational arrangements for KM in their organizations and the kinds of KM initiatives and programs undertaken.

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## 5 Wants and Expectations of the Future

So far in this chapter “[Knowledge Management: Origins, History, and Development](#)” have talked about the past and present in order to set a context for a look into the future. As I mentioned before I use ideas from Complexity Theory in my view of the world and one of its tenets is the virtual unknowability of the future. Try to remember what our lives were like just 5 or 10 years ago and what has changed since then. How many of us would have predicted, for example, the pervasiveness

of Skype, Facebook and Twitter? If change continues this way what could possibly happen over the next 5 or 10 years? Probably some quite unexpected technologies and technologically enabled activities will enter into our lives. With this in mind, what I say here will be a best guess but may not be too coherent or prescriptive and I must thank a number of respected KM practitioners who have given me some ideas that I have incorporated here.

The first reply I received to a recent online post asking KM practitioners what they wanted was “The list of things that knowledge managers want is pretty much endless: management buy in, more resources, more recognition . . .”. This I guess shows that KMers are human and implies that they don’t feel that they get such things now. My reflection on this desire for a higher KM profile and visibility is that, if the CKO or Knowledge Manager does have a higher status and big budget, the wrong people might apply for, and get, the job. Maybe part of being good at KM is the ability to stay ‘under the radar’ and ‘work behind the scenes’.

Several practitioners alluded to the ‘fuzzy’ definition of KM and the ongoing question of the need to determine just what constitutes KM practice. One stated that the basic challenge is that there are a range of activities that get badged ‘KM’. Another noted that it often seems to boil down to implementing SharePoint, implying that this is well short of what KM could and maybe should be in maintaining and leveraging the organisation’s knowledge resource. A prevalent view is that KM is full of contradictions and that sharpening up the fuzzy definition, trimming down the broad scope, updating the Standard would be on a KM practitioner’s wish list. A number of posts to online the KM discussion alluded to the overlap of KM with other areas such as change management, risk management sustainability and organisational learning so that clarification of the boundaries between them would be desirable. This was summed up in one post saying: “Because the boundaries are fuzzy, the potential coverage of KM is huge (everything from the coding data analytics to running org change projects) and it’s hard for any one KMer to have a comprehensive view of everything and sufficient depth of skills”.

However not all practitioners were so sure that the uncertainty and diversity surrounding KM definitions and activities was a problem. Indeed some see it as a real strength showing where KM is today may go in the future. I am a long-time supporter of this view. My main contribution to the Australian KM Standard was the chapter on the “Build Phase” of the KM Cycle (Fig. 5). It is all about exploring, prototyping, safe-fail, getting buy-in from management and bringing people along through change. While I am conscious that KM can make sense to people in different ways, and most prefer some semblance of order, I empathise with those confident enough to practice KM in innovative ways in uncertain and unpredictable circumstances.

In this vein I present some of the more thoughtful responses I received in answer to my question about the future of KM practice that I posted online.

The capability of KMers to deal with diversity is explained this way. “I’d also push back a bit on the idea that KM can’t be ‘experts in everything’. An architect can’t manufacture all the materials she uses to construct buildings, but she can still

understand their purpose and where there are alternative approaches, their pros and cons.”

Two divergent KM approaches were described as “either having a general plan to manage information and capability that allow people to undertake KM initiatives or alternatively, you can focus on reactively identifying and addressing specific problems. The second approach is easier to prove ‘value’ and in all honesty, is where I would start given the general lack of trust in KM’s overall ability to deliver”.

Another respondent put it this way. “My observation is that KM is about sharing rather than hoarding, cooperation rather than competition, social learning, team building and promoting the work of others. This is not the normal stuff that builds careers and help you climb up the corporate ladder. To that end I think that KM practitioners, more than anything else, need practical methods with a robust theoretical basis and evidence of success (as compared to wishful thinking) to gain the attention and acceptance of senior management.”

Reflecting on these statements, I return to the idea that KM practice in organisations is basically about being able to make good decisions and acting on them to solve problems and innovate. This can be in either a formal, mechanistic way or an informal, organic manner. The latter requires the establishment and maintenance of a knowledge ecosystem that encourages a cooperative culture to build and sustain collaborative relationships between people both within and across the organisational boundary.

One practitioner put it this way: “Armed with an overflowing toolbox of techniques and practices I would be surprised if the KM practitioner could not add significant value if only they can position themselves appropriately in the influence network supporting these decisions. This is about leadership without authority.”

In the KM practitioner’s toolbox are many ICT-based systems. One of respondents mentioned these specifically, saying: “With a whole raft of easy and compelling-to-use Business Information Systems (sometimes called KM systems) KM can give the business a way to use them when and where *they* want them. If these systems are easy and compelling to use and have data or information in them that is useful to the business user, then uptake is quicker and easier.” They went on to mention that CIO’s are barely looking at this, (either just don’t get it or it is all too hard”).

Much of my work as a KM practitioner involved consultancies to do with the use of corporate Wikis. Some of this work also fed into our research and was published (see Hasan et al 2009; Pfaff and Hasan 2011; Hasan and Pfaff 2012). This research found a general resistance to, and ignorance by, mainstream IT of the whole concept of user-created knowledge repositories from which followed a more democratic view of organisational knowledge. This has changed to some extent more recently, main through the popularity of Wikipedia. However management still views with suspicion the idea that all workers are knowledge workers who can contribute knowledge about work to the organisation’s repository of knowledge in a democratic way.



Among my network of KM practitioners is Laurie Loch-Lee<sup>1</sup> an expert on Social Network Analysis (SNA) who recommends the application of SNA so that organisations can look more closely at patterns of interactions between people in order to value and leverage the existing knowledge networks within organisations. The great value that I see in SNA is its ability to allow people to visualise these patterns of interaction. The maps produce by SNA software often provide insights into the way knowledge is created, shared and used in organisational networks that are invaluable to KM initiatives and programs.

Metaphors commonly used in respect of KM are ‘organisational memory’ and ‘organisational learning’. These imply that organisations are organic in nature and behave in ways that resemble the way people behave. The corollary of this seem to me to be that such views are only valid if the social networks within organisations are supported and people are empowered to co-create the organisational memory.

This leads us on to the issue of a supportive corporate culture and organization environment for KM. On this topic, one practitioner said the following: “A necessary adjunct to this is the culture of course of sharing, and developing new information for use, rather than knowledge keeping and secrecy. I think that is environmental, so while its valued it works, as soon as its not it doesn’t – one of the many reasons KM doesn’t stick.”

In addition to issues of networking, knowledge sharing and cooperative collaboration, the online conversation on the future of KM looked at attitudes to change, risk and personal motivation in this regard. Many see resistance to change, general risk aversions and the balance of long term against short term risk as challenges for KMers in dealing with people. The following are three interesting comments in this regard:

When you view this thread about insights on knowledge and KM from a humanistic perspective, one lens I use is ‘resistance to change’ by people. Why do they resist? Besides personal gain and other political considerations (btw, I find that is something only other people do;-); in some (many?) cases it is because their own knowledge framework (in their heads) leads to a different interpretation of information and situation. And that is both frustrating (most often to the originator) and inspiring because a lot of invention and innovation arises when people do interpret things differently.

An often potent lens is to gauge a person’s emotional response to the information meaning, content and the person delivering it. The risk lens and ‘aversion’ to change can be seen as driven by the emotions we associate with that risk. If a risk became a reality and caused us harm, we naturally become more averse. If the risk has a positive effect (e.g. good bet on buying shares and/or we are rewarded for managing/surviving a risky event) then we are likely to increase our risk taking.

People who have never encountered a risk with adverse effects either have to be able to relate that risk to a similar risk/event (cognitive association - which most people have trouble doing) or are unlikely to be adverse to that risk. Otherwise called ‘learning from experience’ - sometimes we use a lot as children.

Every now and again I come across an article or blog about KM that reminds me that one of the common attributes of experiences KMers is their ability to come up

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<sup>1</sup> For more see [www.optimice.com.au](http://www.optimice.com.au) his blog: <http://governanceandnetworks.blogspot.com/>

with interesting ideas that can often inspire innovative change. Some ideas that are not really new but are always interesting concern the design of spaces within organisation that promote chance encounters and provide inspiring environments from which new collaborative ventures emerge. Such an article is found here <http://www.geyer.com.au/posts/designing-physical-space-as-a-knowledge-management-and-collaboration-tool>. Such ideas can apply to both physical and virtual spaces.

In concluding this somewhat disjointed speculation on what practitioners want, expect and think about KM going into the future I must include a comment from one practitioner that “the idea of actually having a theoretically sound understanding of organisational behaviour that can be applied in practical ways excites me!” By interjecting some of my thoughts among those of the practitioners I have some hope that they may be interested in the theoretical findings of some of the research undertaken by KM academics. The challenge that we must face is how to make these findings more accessible to practitioners who I doubt read the academic journals in which academics are required to publish if they want grants and promotion!

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### Conclusions

One of the practitioners who joined the online conversation was concerned that the way organisations describe job roles is still largely ‘industrial age’. He warned against viewing KM practice as “a laundry list of job tasks, with a list of competencies to match to those job tasks and then assessing performance against the job description. In essence we are looking to have people do the same job the same way, which was appropriate in the industrial context, but I would suggest, not in this knowledge era”. Looking around our university, supposedly a knowledge institution, the role of academics and other staff seem to be treated in an ‘industrial age’ manner in the belief that this is following best business practice and is more business-like. I am in a Management Department of a Business Faculty where we find out in our research and teach students about good ways to do KM are not reflected in the way our institution is managed in practice. I suspect this is true in many institutions, firms and organisations of all kinds. The KM practitioners whose opinions I have presented here hope to change this in the belief that fundamental core business decisions are clearly knowledge based and ‘good’ KM is desperately needed.

I have observed that very few people start off their corporate career wanting to be a Knowledge Manager. Those who go to university or college in order to study KM have rarely come straight from high-school but are usually people who have discovered KM in the workplace and want to learn more.

I suspect that there continues to be a sort of informal apprenticeship that most people need before they are comfortable in KM shoes. The Australian KM Standard was put together by a committee of representatives of interested associations and organisations over a period of 4 years. I remember almost every time a new person replaced the former representative from their organisation, we revisited the discussions on ‘what is knowledge’, how does it differ from information, can you really ‘manage knowledge’ and how can you

'measure' the benefits of KM. The only representatives that stayed on the committee were those who became comfortable with the notion that we could proceed to develop the Standard without definite answers to these questions.

One of my students once said "you can't manage knowledge so you shouldn't call it KM" to which I replied "then what is 'it'?" After nearly 20 years of use, my view is that KM is as good a name as any to describe the way organisations recognise, deal with and use what they know or need to know. It seems to help if we take the view that KM is essentially about enabling people to better understand and interpret their world in order to make difficult and important decisions. This can be sometimes be organic and informal and so fly under the radar. KM initiatives are varied and require a whole kit of tools and capabilities. Successful KM practitioners are, and will continue to be, those who can manage these, knowing their own organisational circumstances and people well enough to do this to advantage.

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# The Next Generation of Knowledge Management: Mapping-Based Assessment Models

Giovanni Schiuma and Daniela Carlucci

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## 1 Introduction

In the last decades the academic and practitioner interest about why and how to assess, leverage and manage knowledge resources for improving organisational performance has greatly increased (Carlucci and Schiuma 2007b; Grant 1996; Schiuma et al. 2007; Sveiby 1997). Concepts like human, relational and structural capital have been introduced to describe the whole features of knowledge resources as well as to deal with managerial need of identifying, evaluating and better managing these resources. Intellectual Capital (IC) concept has been proposed such an umbrella concept, offering a broader view on organisational knowledge resources and a better understanding of the potential patterns of coexistence among the subcategories of intangibles (Carlucci and Schiuma 2007b).

Several management models of knowledge resources have been proposed, dealing with two main purposes, closely interrelated, complementary each other i.e., the ‘value management’ and the ‘value communication’ purposes (Lonnqvist et al. 2009; Schiuma 2009).

The ‘value management’ purpose concerns the collection and communication, especially throughout the organisation, of information about knowledge resources (e.g., knowledge resources measures), and the processes of creating and developing knowledge in order to support organisational value creation and performance improvement. In comparison, the ‘value communication’ purpose, concerns the communication and the reporting, internally and/or externally, of the value related to knowledge resources and generated and/or incorporated by the organisation.

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Over the years around the themes of ‘value management’ and ‘value communication’ of knowledge resources, a huge amount of academic research and practitioner studies has been produced. The studies have been characterised by several perspectives of analysis. In this regard Carlucci et al. (2004) and Carlucci and Schiuma (2005) suggest three main IC management perspectives, i.e. strategic, managerial and operational.

The strategic perspective addresses knowledge resources management strategy that, to be successful, needs to be integrated and aligned with the company’s strategy.

The managerial perspective comprises approaches and methodologies for organizational knowledge assessment and management. In this perspective, two main research streams can be identified: knowledge development and knowledge assessment. The first is strongly linked to the literature on learning organizations and involves all approaches and processes for creating and managing knowledge within an organization. The knowledge assessment is aimed at providing methodological approaches and tools to identify, classify and evaluate knowledge within a company.

Finally, the operational perspective includes the set of organizational and managerial activities and projects such as teamwork, meetings, benchmarking of best practices, community of practice and so on. This perspective also includes projects to implement ICT tools designed for the development and use of knowledge.

Recently one of the topics that has greatly drawn scholars’ attention regards the complex dynamics through which knowledge resources, properly managed, take part to company’s value creation (e.g. Carlucci and Schiuma 2007a, 2009; Carlucci et al. 2004; Carmeli and Tishler 2004; Daum 2002; Fathian et al. 2008; Hsu and Wang 2012; Liebowitz 2005; Martin 2004).

This is because even if nowadays the management literature has pointed out that knowledge resources and their management may have significant positive effects on organisational performance, more remains to be understood about how these resources can be coherently and successfully converted into value, what are the “right”, or appropriate approaches to assess and manage these resources, and how these approaches can disentangle the mechanisms by which those resources contribute to improve companies’ capability to compete in today’s competitive scenario.

This chapter provides a contribution to the emerging discussion concerning the definition of new KM models specifically aimed to a better understanding of KM outcomes and value. Our purpose is to define a conceptual background which can inform the development of the next generation of KM. This has to be primarily concerned with the understanding of the value of KM and specifically how KM can really drive and impact business value creation and growth. For this reason on the basis of some previous works of the authors (Carlucci and Schiuma 2007a, 2009), the chapter analyses how to elicit the mechanisms of conversion of knowledge resources into value through the use of visual techniques. In particular the AHP based mapping model is proposed. It allows the identification of the knowledge asset value drivers on which management attention should be focused as well as

enables to highlight and assess the network of relationships between and among knowledge assets, and between knowledge assets and organisational performance.

The model, in line with the emerging KM research issues, looks beyond the view of the traditional models and approaches to KM mostly focused on KM concepts, processes and enablers (e.g. Boisot 1998; Nonaka 1991; Wiig 1993) and focuses on how KM intervenes in organisational value creation dynamics.

Understanding how capturing value from KM is relevant, today more than ever. The overload of data and information, the limited availability of financial resources to invest, the increasing need of change and innovation, the competition in a dynamic and unpredictable scenario, struggle organisations to know how optimising the use and the development of their resources, included knowledge resources, to create value.

Managers and decision makers need approaches and models able to drive them in the complex decisions regarding how actively managing knowledge resources and assessing the achieved outcomes. In such a prospect it is critical to improve knowledge about KM value (regarding e.g. how KM is adding value to organisations; how to evaluate it; how to assess KM outcomes), by enriching the plethora of related studies and models that, to date, to our knowledge, still remains limited.

The proposed model attempts to deal with these emerging topics of KM research and provides managers with a practical approach to grasp the conversion of knowledge resources into value. It shares some fundamental hypotheses of other similar approaches proposed in the strategic management literature to visualise the causal links between intangible value drivers and organisational performance outcomes and builds on mapping principles and the application of a multicriteria method, i.e. the Analytic Hierarchy Process (AHP). The rationale behind the use of mapping is related to the fact that making map, especially with reference to complex phenomenon to deal with, improves the usability of information and knowledge – even uncoded – and also complements what the brain can do imperfectly. Maps allow the separate encoding of information in memory in visual and propositional form that facilitates reasoning and the disclosure of complex issues, such as the knowledge based value creation dynamics.

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## **2 Knowledge Management, Value Creation and Mapping**

In the last decades a number of contributions have outlined the importance of knowledge assets in determining the company's ability to generate value for stakeholders (Carlucci et al. 2004; Daum 2002; Roos et al. 2005).

Despite that, the number of studies aimed to shed more light on the dynamics which link knowledge assets to value creation remains limited. There is still a need for further exploratory studies to provide a more detailed appreciation of the issues involved in value conversion of knowledge assets.

In the last decade in strategic management literature, some models aimed to represent explicitly organisation's strategy to be implemented, have addressed, to some extent, also the role of knowledge resources in strategy execution.

These models originate from the need to deal with the general lack of understanding of the process or "how" aspect of organisational strategy (instead of contents or "what" aspect, characterising the rational economic perspective, see e.g. Porter's approach).

In particular, Kaplan and Norton (2000, 2004) have proposed the Strategy Map as a visual framework of the cause-and-effect relationships among the components of an organization's strategy, and as a means to integrate the four perspectives of the Balance Scorecard.

The strategy map provides a framework for linking intangible assets to shareholder value creation through four interrelated perspectives (financial, customer, internal processes, learning and growth). At the foundation of the map there is the learning and growth perspective which identifies intangible assets that are most important to the strategy. The objectives in this perspective identify which human capital, information capital and organisation capital are required to support the value creating internal processes. These intangibles must be integrated and aligned with the critical internal processes.

Neely et al. (2002) have suggested the Success Map as a useful approach to help managers to align company's strategy, processes, capabilities and stakeholders' satisfaction and contribution. Success Map is basically a representation of how an organisation sees itself. It illustrates causal relationships that lead to the organisational value proposition and satisfaction of key stakeholders. It visualises also how knowledge resources, i.e. capabilities, link into the overall strategy and help to drive organisational performance.

The principles at the basis of the definition of these map-based frameworks are grounded in the idea that there is a logical set of causal relations linking knowledge assets to organization's value propositions and strategic objectives (Amit and Schoemaker 1993; Carlucci et al. 2004; Grant 1996; Lev and Daum 2004; Prahalad and Hamel 1990; Teece et al. 1997).

Through mapping these relations are depicted to provide a visual representation of managerial assumptions concerning the formulation of the strategy and, somewhat, an elucidation of the role of intangible domain in strategy implementation.

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### 3 Visual Mapping

The use of maps for visualizing, describing and understanding phenomena and "reality" is not new. Maps represent one of the oldest forms of nonverbal communication. They have a high descriptive power. In particular, they provide a valuable visual representation of a phenomenon or "reality" that highlights the relationships among its elements/dimensions. Wood (1992) points out that maps don't just reflect "reality," but they help to create it. Maps can be simply "factual". However they need to be read carefully as contextualized documents. Maps are made, at a

particular moment in time, by people who are embedded within a social and personal context, that can and do influence the map. Consider, for example, the maps of the Earth's surface. They are significantly changed along the centuries. This is an important aspect to consider with regard to the nature of the contents embedded in a map.

Maps have been used in various fields, such as, for example, psychology, education, planning, and management.

Their wide use can be related to their two main functions. The first one is the descriptive function. A map provides a visual representation that can help individuals to elaborate a problem statement, to transform its ambiguous status into an explicit condition, to constrain unnecessary cognitive work, and, eventually to create possible solutions (Larkin 1989; Scaife and Rogers 1996; Vekiri 2002).

The second function is related to a map as a "thinking tool", which supports the processes of generation and elaboration of ideas, not necessarily connected to an explicit focused question or context frame.

More widely if we consider that an enormous amount of capacity of our brain is dedicated to visual processing, the usefulness of maps clearly arises.

With reference to research regarding KM value, mapping, with its various forms, e.g. cognitive, concept, causal and mind maps, can be used as a tool able to enrich the view offered by knowledge based strategy models (Sveiby 1997; Zack 1999; Wiig 1997) or by the strategy/success maps, with a more dynamic representation of managerial cognitions regarding the development and exploitation of knowledge resources.

Building maps allows to capture the ways managers or groups of managers understand how to extract value from organisational knowledge. In other words it allows to capture a management challenge, such as the effective KM and the assessment of its outcomes, through the eyes of those organisational actors (e.g. managers) who are engaged in interpreting and responding to the challenge.

Building maps, and in particular causal maps, allow to develop a dynamic representation of managerial cognitions in that they allow ideas to be linked together and their relationships defined in causal sense.

The result of mapping is a visual representation that (i) facilitates the description and communication of ideas and viewpoints from several sources; (ii) supports the identification and the interpretation of information, by providing a picture of the phenomenon under investigation; (iii) facilitates the consultation and codification among individuals (i.e. managers, researchers, consultants, decision makers) and (iv) stimulates mental associations, improving the quality of conversation and decision making process.

In such a prospect another useful aspect of mapping is that it is a facilitation device. Maps, and in particular causal maps, can be helpfully used in an interactive research approach where they are used to facilitate debate. This is crucial in dealing with KM value issues.



### 3.1 Cognitive, Concept and Mind Map

In the last decades, closely connected to the mapping concept, many notions embracing mental processing, methods for structuring, storing and representing knowledge, or, more generally, approaches and tools for opening “mind’s eye”, have been introduced.

Among them, cognitive map (Tolman 1948), concept map (Novak 1998) and mind map (Buzan 1995).

Cognitive, concept and mind maps are methods mainly aimed at structuring knowledge according to different approaches and with various purposes. In particular, cognitive and concept maps are methods used: (i) to arrange and store knowledge in order to reduce individuals’ cognitive load; (ii) to improve mechanisms for analyzing real situations and describing activities problems and projects; and (iii) to enhance learning. They have mainly a descriptive function, since they allow to represent and to handle knowledge components and their links. While mind maps are evocative methods as they are mainly applied to stimulate the generation of ideas, aid creativity and encourage brainstorming approach.

From a descriptive viewpoint, cognitive mapping, mind mapping and concept mapping differ in some fundamental ways. The mind map structure branches out from a central idea (e.g. central word or concept) – while concept and cognitive maps are generally complex networks.

Another difference between the methods is that in cognitive map the links stand basically for causal relations. While in a mind map the links are usually “passive”, not representing anything more than association. In fact, a mind map provides a visual, non-linear representations of ideas and their relationships’ (Biktimirov and Nilson 2006) and its creation requires a free-form, and spontaneous thinking creative associations between ideas.

In concept maps the links are labelled with descriptions, defining the association between concepts.

The main use of mind mapping is to create an association of ideas with “free-form” and unconstrained structure which promotes creative thinking, and encourages “brainstorming”. The main disadvantage of a mind map is the absence of clear links between ideas (they are just associations). As highlighted by Eppler (2006) mind maps are idiosyncratic in terms of their design, often hard for others to read; representing only hierarchical relationships (in radial form); inconsistent in terms of level of detail; and often too complex and missing the “big picture”.

In cognitive maps, and in particular in concept maps, the links are not based on spontaneous associative elements but they outline relationships between ideas.

The links use connective terms (relational phrases) to characterise the relationships between the elements of the map and shape a hierarchical “tree” structure with super-ordinate and subordinate elements.

A particular subset of cognitive map is the causal cognitive map. Causal maps represent cognition as a set of causal interactions.

A causal cognitive map is a graphical representation where nodes represent concepts, and links (arcs or lines) represent the perceived causal relationships

between concepts. The arcs may indicate only the presence or absence of a relationship or may indicate the strength of the relationship between two nodes.

Causal maps are widely used in the context of strategic management research, where a wide range of techniques has been applied in an effort to map the mental representations of decision-makers and to stimulate a thought or decision-making process.

More generally causal maps are used by managers (i) to focus attention on the root causes of a problem, (ii) find critical control points, (iii) guide risk management and risk mitigation efforts, (iv) formulate and communicate strategy, and (v) analyse the critical causal relationships in a complex system.

The main advantage of cognitive, and especially concept mapping, is its relational aim. It allows to address and visualise the relational links to be made between relevant concepts.

The main disadvantages of concept mapping are that the maps can be idiosyncratic in terms of design and their complexity may not always assist memorability (Eppler 2006).

Some scholars have outlined that the rigid rules used for identifying concepts and their multiple relationships does not make the process simple and the linear nature of concept maps mean that they are not adequate to capture more complex relationships between concepts. In particular, they do not enable easy separation of concepts of critical importance from those of secondary importance (Daley 2004).

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## 4 An AHP-Based Map for Grasping Knowledge Based Value Creation Dynamics

We propose the use of causal cognitive mapping to visualize, describe and understand the relationships linking knowledge assets to company's value creation. Especially, we introduce the knowledge assets mapping methodology as a powerful approach for disentangling the knowledge dimension of the complex "system" describing the company's value creation "phenomenon". Several elements characterize this "phenomenon" such as knowledge assets, organizational competences, processes performance, strategic objects, value propositions and their reciprocal relationships.

As previously underlined, in strategic management research, these elements are connected through cause-effect relationships. Knowledge assets are linked to the development of organizational capabilities, that drive the improvement of organization's business and operation processes, which, in turn, allows to achieve the strategic company's objectives and to deliver the promised value proposition (Carlucci et al. 2004).

The proposed knowledge assets mapping methodology accomplishes two main purposes. The first purpose concerns the visualization of the network of relationships which link knowledge assets to the other elements of the "system", i.e. organizational capabilities and processes performance. The second purpose concerns the identification of knowledge assets value drivers on which company's

investments should be focused. This identification is based on the assessment of the relative importance of knowledge assets for the achievement of processes performance at a given point in time.

Therefore, the knowledge assets mapping methodology can be used as a powerful managerial approach both for identifying what are the key knowledge assets grounding value creation and describing how managing knowledge assets contribute to create value.

The proposed methodology combines causal cognitive map principles and Analytic Hierarchy Process (AHP) method. What results is a map that we label Knowledge Assets Value Creation Map (KAVCM).

The basic rationale behind the use of AHP is related to the need of highlighting the elements of the causal map of critical importance against the value creation objectives.

In recent decades the AHP has emerged as a versatile Multiple Criteria Decision Making method and evaluation methodology with wide-ranging applications. AHP and its variants have long been used for supporting, analysing, simulating and explaining numerous complex decision processes related to various fields (e.g. economics, energy, planning & budgeting and performance & risk assessment).

Using AHP method provides several benefits. An important advantage is its simplicity. Schoemaker and Waid (1982), in comparing five conceptually different approaches for determining weights in utility models, found that subjects perceived AHP as the easiest method to use and the one whose results were most reliable. The AHP can also accommodate uncertain and subjective information, and allows the application of experience, insight and intuition in a logical manner. Further advantages (see e.g. Mendes 2011; Qureshi and Harrison 2006; Saaty 1994) include that AHP accommodates multiple criteria, provides a method making it possible to include in the analysis quantifiable and non-quantifiable factors, is simple, intuitive, and yet has mathematical rigour, integrates subjective judgments with numerical data, can facilitate participation, provides for transparency, allows audit trail of the decisions, encourages a process of learning, debate and revision.

However AHP also presents some potential disadvantages, including the potential inconsistency of the decision-makers' judgments and rank reversal, the length of the process, which increases with the number of levels and number of pairwise decisions, the potential difficulty of obtaining pairwise comparisons when information about criteria and/or alternatives are vague.

Recently Ishizaka and Labib (2011) in their review of the main developments in AHP, concluded that "AHP has broken through the academic community to be widely used by practitioners. This widespread use is certainly due to its ease of applicability and the structure of AHP which follows the intuitive way in which managers solve problems. The hierarchical modelling of the problem, the possibility to adopt verbal judgements and the verification of the consistency are its major assets" (p. 1436).

For the purposes of proposed mapping methodology, AHP was chosen in light of the above mentioned benefits and especially for its simplicity (Schoemaker and

Waid 1982) and its wide and successfully application in practice (Ishizaka and Labib 2011; Saaty 2008, 1994; Yu and Chen 2005; Zahedi 1986).

#### 4.1 Building the AHP Based Map

As above underlined, the rationale for building a KAVCM is basically to identify the key knowledge assets value drivers and visualize their dynamic interaction in order to gain useful insights concerning the “knowledge foundation” of company’s value creation process.

Regarding the domain of application, the knowledge assets mapping methodology can be adopted as a standalone approach or as an integrated and complementary methodology of the strategy map to drive the definition and implementation of a company’s strategy.

Therefore the KAVCM can be built focusing on a specific key process and the related performance objectives, or, according to a broader view, on the whole of key company’s processes and connected performance objectives. Building a KAVCM requires some basic steps:

- Step 1: Clarify the domain of application of the KAVCM;
- Step 2: Identify the elements of the map and the cause and effect links between them;
- Step 3: Evaluate the relative importance of the elements of the map;
- Step 4: Visualise and analyse the KAVCM.

Each step involves a number of activities to perform. In the following they are briefly described. Additionally a set of tools supporting some of these activities are suggested.

##### **Step 1: Clarify the Domain of Application of the KAVCM**

Establishing the domain of application of the KAVCM means a clarification of the purpose for which the layout of the KAVCM must to be created.

The KAVCM can be built both for investigating in detail the knowledge foundation of a company’s strategy as a whole, and disclosing the relevant knowledge assets for achieving targeted performance related to specific company’s key processes. In both cases, building a KAVCM requires a preliminary reflection on business processes and related performance that are significant for the successful delivery of company’s value proposition.

##### **Step 2: Identify the Elements of the Map and the Cause and Effect Links Between Them**

Once clarified the domain of application of the map, its components have to be identified.

The main building blocks of a KAVCM are: company's key processes performance, capabilities estimated as important in order to gain key processes performance, and knowledge assets that ground those capabilities.

The identification of the elements of the map is based on a clear understanding both of company's key processes performance and the capabilities estimated as important in order to achieve targeted performance objectives. Additionally the knowledge assets grounding capabilities have to be disclosed.

The identification of knowledge assets underpinning capabilities can be facilitated by means of a matrix that has organisational knowledge assets listed in rows and capabilities listed in columns. In this regard, a classification of organisational knowledge assets is very useful. There are several kinds of knowledge assets within an organisation, e.g. employee's motivation, brand, image, database, routine and practices, relationships among colleagues, and so on. The Knoware Tree (Schiuma et al. 2005) provides a very valuable classification of knowledge assets of an organisation. This classification is based on the acknowledgment that for any organisation it is possible to distinguish two main components: its actors, both internal and external, and its structural components, i.e. all those elements at the basis of the processes. Starting from this assumption the model defines two main categories of intangible resources: the resources related to the organisational stakeholders – named Stakeholder Knoware – and the resources related to the tangible and intangible infrastructures of an organisation – named Structural Knoware. The two categories can be further divided into others sub-categories, specifically: Wetware and Netware for the Stakeholders Knoware, and Hardware and Software for the Structural Knoware.

The Wetware category denotes all intangible resources related to the human resources of an organisation, e.g. innovative capability, creativity, experiences, team-working and problem solving capabilities, skills, leadership, tolerance for the ambiguity, involvement, loyalty, learning capability, level of formal and non formal education, and so on. The Wetware, then, gathers all intangible resources that are at the basis and influence the behaviour and capabilities of human resources.

The Netware category includes the set of intangible resources related to the relationships characterizing an organisation. This category of capital has been described in the strategic management literature in different ways, such as relational capital (Ireland et al. 2002), customer capital (Bontis 1998), social capital (Fischer and Pollock 2004). The resources included in the Netware can be either internal to the organisational context, e.g. the stakeholders networking dynamics taking place within an organisation, or external, representing all the possible ties linking an organisation to its external economic, production and socio-cognitive environment.

The Hardware category includes all those resources relevant for the development, acquisition, management and diffusion of knowledge, but tangible in nature as well as all the components linked to structural features of the organisation. This category involves two main sub-categories, i.e. the physical infrastructures and the technological infrastructures.

**Table 1** An example of matrix for the identification of knowledge assets

	Knowledge assets	Capability A	Capability B
Wetware	Problem solving capability		×
	Creativity	×	×
	Motivation	×	
	.....		
Netware	Employees’ relationships		×
	Customers’ relationship		×
	.....		
Hardware	Equipment		
	Software	×	×
	Databases	×	×
	.....		
Software	Brand		×
	Image		×
	Values	×	
	.....		

Finally, the Software category denotes the organisation structural capital having soft nature and affecting the value creation mechanisms of the organisation. It comprises attitudes, norms, values, behaviours and other cultural dimensions of an organisation and involves mainly aspects related to the social resources, which affect the organisational output through changing the manner in which human resources use their cognitive abilities to innovate, to lever the tangible and financial resources as well as to develop relational resources. In addition the Software category includes the organisation’s intellectual property.

Table 1 shows an example of matrix for the identification of knowledge assets founding organisational capabilities. Using this matrix, managers can evaluate if a knowledge asset significantly contributes or not to generate capability shown on the column.

A similar matrix could be used also for facilitating the identification of those capabilities that significantly influence key processes performance.

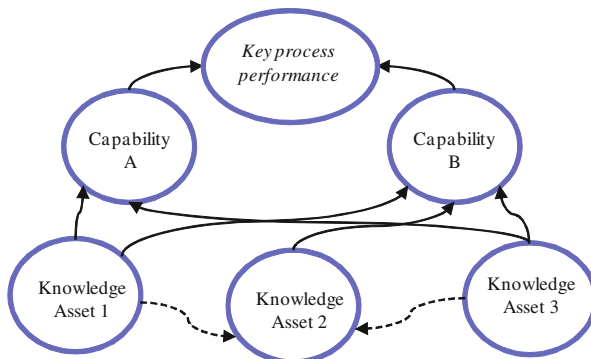
Key processes performance, capabilities and knowledge assets are represented in the map by nodes; while their links are represented by continuous arrows.

Regarding the identification of relationships among the elements of the map, it is interesting to highlight that knowledge assets are not just static assets but they dynamically interact with each other to be transformed into value (Roos et al. 1997; Teece et al. 1997). Especially knowledge assets operate as a bundle of resources in building and affecting capabilities (Dierickx and Cool 1989; Lippman and Rumelt 1982). Therefore it is important to take account of the relationships linking the different knowledge assets among them in the value creation dynamics.

The identification of these relationships can be facilitated by using a matrix which has both on the rows and the columns the knowledge assets. In the cells of the

**Table 2** An example of matrix for the identification of the links between knowledge assets

	Knowledge asset 1	Knowledge asset 2	Knowledge asset 3	.....
Knowledge asset 1		×		
Knowledge asset 2				.....
Knowledge asset 3		×		
.....				.....



**Fig. 1** The basic frame of a KAVCM

matrix a judgment, regarding the existence or not, of an influence between knowledge assets can be expressed.

Table 2 shows an example of matrix for the identification of the links between knowledge assets.

Capabilities and processes performance, likewise knowledge assets, can be interconnected. In this regard, the identification of the interrelationships both among processes performance and capabilities can be facilitated by means of a matrix similar to the matrix shown in Table 2. The interrelationships among the elements of the map are represented in the map by dashed arrows.

Key processes performance, capabilities and knowledge assets with the related links constitute the basic frame of the KAVCM (see Fig. 1).

The frame, represented in Fig. 1, provides as causal map a visualisation both of the elements of the KAVCM and their reciprocal relationships. However, it merely describes but does not provide any evaluation of the contribution of knowledge assets to value creation. The next step of the building process of the KAVCM deals with this evaluation.

**Step 3: Evaluate the Relative Importance of the Elements of the Map**

The evaluation of the relative importance of the elements included in the map shown in Fig. 1 mainly aims to identify knowledge assets that play a key role in the achievement of company’s performance objectives and, as a result, in creating value.

As previously said, we propose the use of a multicriteria decision support method for evaluating the relative weight of the elements of the map: the AHP. Its application requires an interpretation of the elements of the map, i.e. key processes performance, capabilities and knowledge assets with the related relationships, in terms of the three basic elements, i.e. general goal, criteria and alternatives that characterise the representation of a decision problem according to a multicriteria based approach. In our case the achievement of targeted key processes performance, capabilities and knowledge assets stand for respectively the general goal, criteria and alternatives.

The AHP has been extensively used in several decision problems. As previously argued, the success of this methodology is partly due to its relative simplicity of use, but it is almost certainly related to its effectiveness in supporting the three main phases of a decision process: problem structuring, evaluation of criteria and/or alternative performance and analysis-synthesis (De Brucker et al. 2004; Forman and Gass 2001). In addition, AHP is able to deal with imprecise and subjective judgments that characterize decisions that can affect several groups or stakeholders on a long time period.

From an operational point of view, the application of AHP requires the collection of managers' opinions and judgments regarding the importance of each decision element against the elements of the map linked to it.

The collection can be carried out through several methods such as, for example, interviews, questionnaires, workshops and focus groups. Especially, for determining the relative importance of the elements, managers have to be asked to respond through a series of pairwise comparisons with Saaty's nine-point scale (Saaty 1980). Saaty's scale requires to the decision maker to assign relative ratings, by expressing his/her preference between each pair of elements verbally as equally important, moderately more important, strongly more important, very strongly more important, and extremely more important.

An example of a question used for pairwise comparison process could be the following: *You are deciding about the factors that affect the development of capability A: which is the knowledge asset that influences the capability A most? Knowledge asset 1 or knowledge asset 3? and how strongly?*

The collected judgments have to be properly handled in order to obtain the priority weights for each decision element. For this purpose, the software ExpertChoice can be applied.

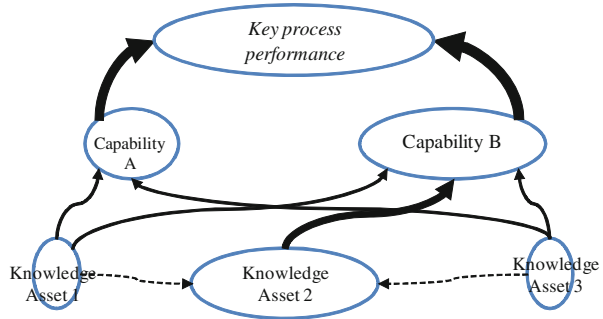
#### **Step 4: Visualise and Analyse the KAVCM**

The main outcome of the AHP application is the evaluation of the relative importance of each knowledge assets against the general goal. This importance is captured in the KAVCM through the size of the nodes of the map. While, the width of the arrow stands for the importance of a knowledge asset for the achievement of the capability in which the arrow ends (Fig. 2).

Despite the relative simplicity of the model, the KAVCM provides very useful information. In particular focusing on knowledge assets, it mainly provides:



**Fig. 2** An example of KAVCM



- A visualization of the links between knowledge assets and capabilities;
- An evaluation of the relative weight of knowledge assets in value creation dynamics;
- A disclosure of those knowledge assets that, due their high weight, significantly support the achievement of processes performance objectives, and, then, the strategy execution and the value creation, i.e. *key knowledge assets value drivers*.

The assessment of the relative importance of each knowledge asset in value creation pathways, allows managers to clarify and test their assumptions about the relevance of knowledge assets for the achievement of strategic outcomes. In fact, managers might intuitively realise that some knowledge assets are more important than others; however the application of a rigorous approach such as the AHP can help them to revise their assumptions and, sometimes, to refocus their attention on company's key knowledge assets. The identification of the key knowledge assets value drivers has great relevance. In fact, knowing these assets, managers can design knowledge assets management initiatives that might have a great impact on company's performance. In other terms, knowing company's key knowledge assets value drivers, allows managers to plan initiatives focused on the effective management of knowledge assets estimated as the most valuable.

## 5 Final Remarks

This chapter responds to the need for new models of KM that would move the field away from the core issues of enablers and processes towards KM outcomes and value.

In particular, the chapter proposes the use of maps as a methodology to assess and understand the scope and impact of KM. In this light the AHP based mapping model is proposed as a method which allows to identify the knowledge asset value drivers on which management attention should be focused as well as to highlight and assess the network of relationships between and among knowledge assets, and between knowledge assets and organisational performance.

From a managerial point of view, the use of proposed model can effectively drive managers towards the design, implementation and assessment of successful knowledge management initiatives. The model, guiding managers towards the analysis of knowledge assets in causal dynamics for value delivering, can help them to align the knowledge assets management strategy with the company's business strategy. In particular, it allows to align investments in knowledge assets management initiatives with business performance targets for the greatest impact on company's value creation. Strategic alignment is the dominant principle in creating value from knowledge assets. Often, even if some knowledge assets are well developed in the company, they are not strategically aligned and this can result in a poor value creation for the organisation against the strategic value propositions.

Concluding it is important to point out that the identification of the key knowledge assets value drivers and the design of initiatives for their effective management is not sufficient. In fact it is important for managers to understand if and how knowledge can be convert into value over time. This entails, in line with the knowledge flow theory, the understanding of how knowledge assets engaged in value creation pathways, are functionally linked, develop and renew over time through cognitive processes, e.g. organizational learning, and proper management initiatives. What is needed is a comprehension of how the transformation of one knowledge asset impacts both on other knowledge assets and organizational capabilities and business performance.

The application of a critical thinking method based on causal loop diagrams, such as the Systems Thinking, could facilitate the explanation and monitoring of how knowledge assets are inter-dependability and dependently linked, and how the management of one knowledge asset activates flow dynamics, which affect both other knowledge assets and organizational capabilities and business performance.

In such a prospect, the use of mapping methodology combined with System Thinking could support the definition of dynamic maps which are capable of describing the knowledge assets flows dynamics.

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## Epilogue

The epilogue to this book, as is appropriate, brings together previous chapters and reflects on what we already know, still need to know, and how to get there. It serves as a thermometer of KM wellness and its life prospect. We are convinced that nine chapters of the book show that KM has a lot to celebrate. They also suggest that the field has a future. This doesn't mean that there are no open issues or controversial points, but these can be seen as exciting challenges rather than insuperable obstacles.

What we have learnt from chapter “[Knowledge Management: Origins, History, and Development](#)” is that KM is a powerful idea whose time has come. It has had a difficult history, but it holds a deep promise to help individuals and collectives create economic value and well-being. The chapter proposes an original reader of KM that strictly connects the different possible views of KM to the distinct “visions” or theories of the firm. In this sense, KM is intended as strictly intertwined with the life of companies and the managerial practices: KM is a “practice-led” field. In this regard, the chapter suggests overcoming rationalistic and positivistic assumptions in favor of a perspective that recognizes the complex spectrum of actual practices in real firms. In this view, the challenge that is proposed is to transform KM into a strategic tool that helps management face the limitations coming from bounded rationality and intrinsic uncertainty that characterize any enterprise, and to turn them into sources of value and profit.

Misconceptions and misappropriations typical for a young movement such as KM are clarified in chapter “[Knowledge Management Concepts and Models](#)”, thus removing the danger of killing the field as a fad. In addition, models describing the key concepts provide a solid basis for exploring different aspects of KM and their applications. As is effectively illustrated in the chapter, there is still much work to do to consolidate KM as a scientific discipline, but it is also comforting to note that this work can be grounded on the efforts of scholars and practitioners which have resulted in a number of “foundational notions” that today represent the core of any KM study: notions of knowledge, KM processes, the role of people, KM strategies, and KM technologies. In this regard, the chapter is also a useful collection of references for those that approach the field for the first time.

Indeed, despite the relatively young history of KM, its body of references is now becoming significant, in quantity and quality. To this, an important contribution has

been given by the foundation of KM-specialized journals that are now becoming an authoritative reference for those that work in the field. However, a reader of this literature highlights its multifaceted nature. Chapter “[A Descriptive Analysis of Knowledge Management Research: Period from 1997 to 2012](#)” proposes an analysis of a key period for the development of KM – from 1997 to 2012. It allows us to understand the trends in KM research as they emerge from the past and are projected toward the future. Important lessons are provided to KM researchers, and useful signposts for defining new research agendas. The main findings reveal the prevalent exploratory approach and the greater focus on some core KM practices, particularly knowledge sharing, rather than on its economic drivers and outcomes. Also, it highlights the strengths and weaknesses of the KM research community, which consists of individuals who are well connected regionally, but are not noticeably active as writers for KM journals. This is an important signal to all those that are struggling to give authoritative recognition to the field.

What we also know about KM is that it is being applied in practice and is making a difference to governments and businesses. Indeed, as was recalled in chapter “[Knowledge Management: Origins, History, and Development](#)”, KM is a practice-led discipline, and therefore its development is influenced by (and, in turn, contributes to shape) the particular contexts where it is applied. More importantly, three chapters showcasing KM in action indicate that practice often behaves according to the principles of a contingency view of KM rather than to some abstract prescription. This is both a strength (because KM remains strictly intertwined with the “real world”) and a weakness (because there is a risk of proliferation of narrow and incompatible methods). Chapter “[Knowledge Management in the Public Sector: UK Case Study Perspectives](#)” offers a deep analysis of different KM implementation strategies within the public sector. Findings are based on an empirical analysis of the UK context, but their validity appears more general. KM is still less developed in the public than in the private sector, but as the authors underline, this context of application will be of great interest in the future, for various reasons: increasing competition between public services and private service companies, which implies an effort of public agencies to improve their efficiency and effectiveness; the highly human-intensive nature of public services, and therefore a recognition of knowledge as a core factor for achieving efficiency and effectiveness; and the increasing turnover of civil servants, which requires modes to transfer knowledge between old and newer employers. The lessons that the authors provide us with are many. In particular, that since public services are different from private companies, KM professionals face peculiar implementation challenges; in addition, that in public services, which are a complex and articulated world, different approaches to KM can be found, as well as different levels of KM maturity. This makes the sense of the challenge clearer.

Chapter “[Supporting Business Managers with Knowledge Management](#)” proposes another view of how the adoption of KM approaches can vary in different business contexts. In particular, it shows how different aspects of KM are being used/need to be used to help business managers make better decisions in different situations. The authors adopt a classic classification of KM initiatives into: human-

based or “social” KM, where the focus is mainly on individuals and their capability to interact and perform mutual learning, and “technology-based” KM, that is grounded on ICT applications. In the chapter, it is highlighted that business decisions are different – and are taken in different ways – in relation to the complexity of decision-making activities. Based on the evidence they found, the authors propose that social KM approaches are more suitable for complex decisions, while KM technologies better fit situations where decision making is simpler. These results not only clarify that there is no “one-best-way” to approach KM, but also that, despite the advancements of ICT applications, the equation “complex problems require complex technologies” is not verified in the case of KM.

Part III ends with chapter “[Understanding and Improving the Professional Toolbox: Communities of Practice as a Paradigmatic Lesson for Knowledge Management](#)”, which tells the story of communities of practice that have a special place in KM: they have become a popular and well-known KM solution, applied by a growing number of companies and public agencies to help knowledge sharing and collective learning. By observing the way the notion of communities has changed over time – and the proliferation of so many different “versions” in real life, the Chapter proposes an analysis of a typical conflict in KM between the efforts of theorization and conceptualization on the one hand, and the business practice in the real world on the other hand. Indeed, there is an important lesson for KM: it is not easy to establish standard KM practices without agreed conceptual foundations, but on the other hand theory needs to be built on an observation of how the practice develops in companies. Especially in KM, researchers and practitioners must learn to proceed together.

So far, our analysis of KM in the past and in the present practice has identified significant research gaps and suggests the need to confront important neglected issues. But what can we expect in the future? What areas will have the most significant – and exciting – advancements? As to what still needs to be known and discovered, a possible way is to contact “those that work in the field”, i.e. to collect and analyze experts’ opinions. This is what is expressed in chapter “[Future Research in Knowledge Management: Results from the Global Knowledge Research Network Study](#)”, which presents a massive survey of world-wide KM experts, both academicians and professionals. The results are of great interest. Particularly, as the author claims, the multidisciplinary character of KM, which is often seen as an element of richness, can also contribute to the lack of agreement on the fundamentals with different paradigms in the field. This is clearly a risk for the development of the field, and calls for a behavioral turn in the KM community: the roots of KM should be reviewed to systematically design research propositions that can be validated scientifically. Also, there may be a need to explore KM as an essential organizational capability, reinforce the need to demonstrate the value contribution of KM and support the continued focus on human and social factors. Of course, how much experts are able to predict the future can be questionable, but the message coming from this chapter is clear: there is still a lot of exciting work to do for both KM academics and professionals.



Chapter “[Future Research in Knowledge Management: Results from the Global Knowledge Research Network Study](#)”, although it doesn’t neglect the practice, is, somewhat, more oriented towards research. Instead, chapter “[What Practitioners \(Should\) Want and Expect: A Personal Perspective](#)” clearly focuses on the “professional job” of knowledge manager; it attempts to speculate on what practitioners expect and want with respect to KM. The author efficaciously integrates her own experience with the perspective of many other KM professionals, and is thus able to provide a stimulating picture and to make some key points for a discussion on the future of KM practice. Among others, one of the most interesting points is that, on the one hand, there has always been a need for standardizing guidelines, job roles, and tasks in KM; but on the other hand, KM practice will need to reconcile the various diversities of programs that leverage knowledge for a productive and sustainable future in different companies. Again, recalling chapter “[Knowledge Management in the Public Sector: UK Case Study Perspectives](#)”, the practice-led nature of KM implies a dialectic interaction between “those that define concepts and standards” and “those that should use them in the practice”. In the end, as the author affirms, “KM is essentially about enabling people to better understand and interpret their world in order to make difficult and important decisions”: in other words, it is about solving problems and not merely “finding a formal definition” to them.

Finally, this inaugural book of the series opens a window towards the future in one of the most debated areas of KM: that of value assessment. Why do we do KM? What’s the value of this? Indeed, any reasoning about KM and its prospects can’t avoid clarifying the connection between the practice of managing knowledge in companies and the economic value that this practice is capable of generating. This issue still presents a struggle for many KM researchers and practitioners. A lot of methods to assess the value of KM have been invented, proposed, and tested, but there is no consensus of what is best. As is suggested in chapter “[The Next Generation of Knowledge Management: Mapping-based Assessment Models](#)”, for KM to be fully incorporated into everyday managerial practices, the “next generation” of knowledge managers may need to explore new ways to fully disclose and assess the benefits of KM. Moving KM forward and away from the core and contingency considerations towards value creation, the chapter proposes a promising value assessment model that is in line with the original KM intent but, at the same time, explores fresh perspectives.

This book is a collection of chapters written by different authors that have their peculiar views and interest. However, there is a dominant optimistic view of KM throughout the entire book. Perhaps, the future will need some critical research approaches, as well as experimentation. We argue here that the use of a diverse set of research methods within KM would strengthen the discipline. The multi-method approach can contribute to objectivity and lead to proven practical applications. In order to move the field forward, there is also a need to strengthen our community of researchers and practitioners in KM. IAKM membership and project involvement is on offer to interested parties.

As the reader can note, this book offers just a sample of possible views and positions on KM and its potential future, and other argumentations and visions may be added. However, our purpose was not to provide an exhaustive explanation of how KM is or should be, but rather to provide food for thought to anybody interested in the development of the discipline. To paraphrase Bertrand Russell, this book may not have helped you find all the answers, but we hope that it will help you ask better questions.

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