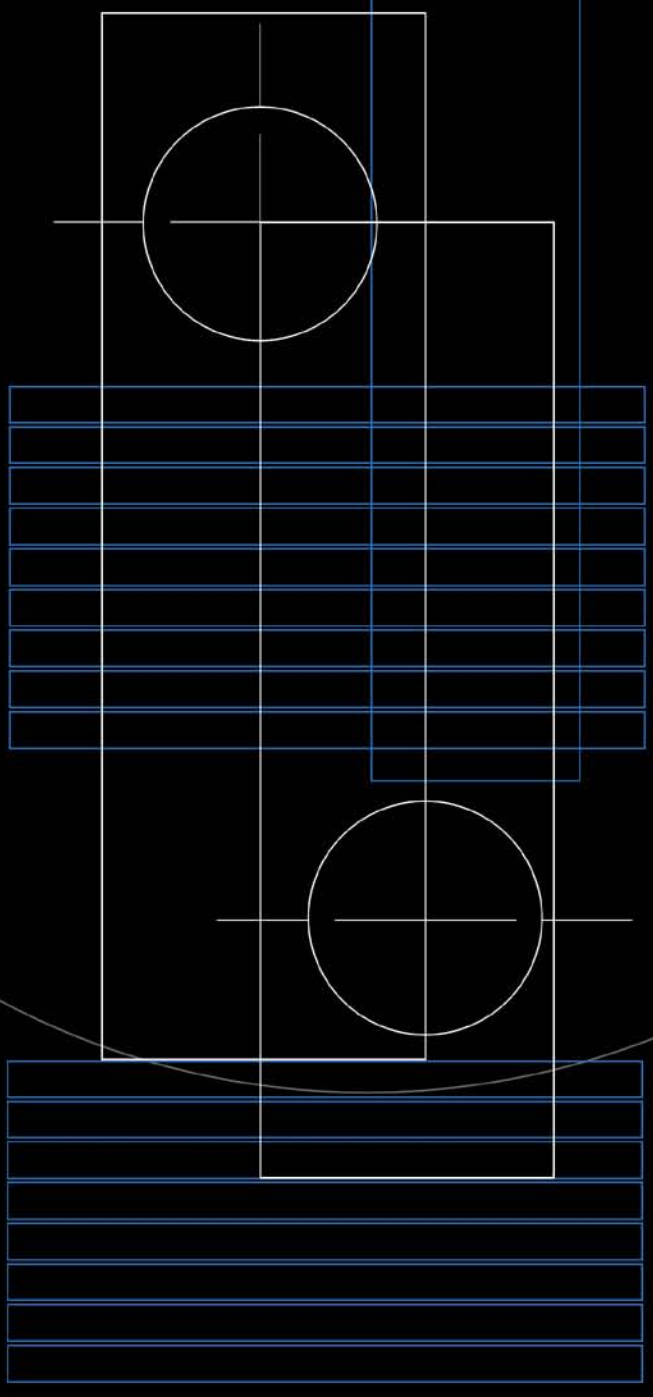

BUILDING INTERNATIONAL CONSTRUCTION ALLIANCES

SUCCESSFUL PARTNERING FOR CONSTRUCTION FIRMS

ROBERTO PIETROFORTE

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E & FN SPON
An Imprint of Chapman & Hall
London · Weinheim · New York · Tokyo · Melbourne · Madras

Published by E & FN Spon, an imprint of
Chapman & Hall, 2–6 Boundary Row, London SE1 8HN, UK

This edition published in the Taylor & Francis e-Library, 2003.

Chapman & Hall, 2–6 Boundary Row, London SE1 8HN, UK

Chapman & Hall GmbH, Pappelallee 3, 69469 Weinheim, Germany

Chapman & Hall USA, 115 Fifth Avenue, New York, NY 10003, USA

Chapman & Hall Japan, ITP-Japan, Kyowa Building, 3F, 2–2–1 Hirakawacho, Chiyoda-ku, Tokyo 102, Japan

Chapman & Hall Australia, 102 Dodds Street, South Melbourne, Victoria 3205, Australia

Chapman & Hall India, R.Seshadri, 32 Second Main Road, CIT East, Madras 600 035, India

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First edition 1997

ISBN 0-203-47696-4 Master e-book ISBN

ISBN 0-203-78520-7 (Adobe eReader Format)
ISBN 0 419 21980 3 (Print Edition)

A catalogue record for this book is available from the British Library

To my son, Alexander, with the hope that he, too, can keep a window on more than one world

Contents

Foreword

This book is a study of the making of an international partnership between an Italian company, Fratelli Dioguardi, and an American firm, Beacon Construction, to permit each to compete more effectively in global markets and to do so by enhancing each company's existing corporate capabilities. What gives this study particular significance is that in this age of strategic alliances, joint ventures and other forms of enterprise cooperation, these firms are not large international firms operating in the capital- and knowledge-intensive industries in which today's multinationals have clustered. Rather the partners are two medium-sized entrepreneurial enterprises in the fragmented, price-competitive building construction industry, an industry in which each phase of the industry's value-added chain has traditionally been carried out by different sets of small specialized firms.

The book's strength rests on its historical approach. It describes how these two enterprises evolved through developing functional capabilities in marketing, management, finance and research in their industries during a time of rapidly changing markets, technology and macroeconomic environment. Both grew in size and competitive strength by creating, enhancing and coordinating their capabilities in the different phases of the building construction process—design, planning and construction. Both moved backward into the acquisition and management of real estate and forward into the maintenance and rehabilitation of existing structures. Both, however, became such integrated enterprises in different ways, with different emphasis on the several functional activities during different time periods of their growth.

The capabilities of each evolved and were reshaped in relatively the same four chronological phases—from World War II until the early 1960s, from the mid-1960s to the mid and late 1970s, followed by a decade of maturity until the late 1980s. Then the declining markets and economic recession that marked the beginning of the fourth phase created pressures to move abroad—pressures that led the two companies to sign their International Bridgehead Agreement in January 1992. The purpose of that agreement was to permit the two

companies to coordinate their different but complementary capabilities. For each company the capabilities created in one period became the base for the enhancement of existing skills and the development of new ones in the succeeding period. By tracing the evolution of these capabilities in each of the companies, this study then analyzes their strengths and weaknesses and so evaluates the potentials of their collaboration in the 1990s.

The company that the two young Dioguardi brothers, Giuseppe and Gianfranco, took over on the death of their father Saverio in 1961 was a successful local building enterprise in the Bari region of southeastern Italy. Personally managed by a charismatic architect and community leader, Saverio's firm designed and built prestigious residential and office structures as well as buildings for banks, the national telephone agency, and religious orders in the Bari area. Its capabilities rested on careful architectural planning and design for much the same clients, and the employment of a core of specialized, skilled construction workers including masons, plasterers, and carpenters.

In the years immediately after 1961, the two brothers began to enlarge the enterprise by building management structures and skills, and developing operating routines and formalized working procedures. They expanded their public and private clients throughout southern Italy, setting up a branch in Naples. With expansion came rationalization of their craft-based industry through the use of standardized and prefabricated building components, creating in 1971 a subsidiary to produce these components. Continuing development of internal managers led to the formation of a management consulting enterprise as another subsidiary. As the residential construction market leveled off, the company moved both upstream and downstream. It formed subsidiaries for real estate development and marketing, property management, developing and producing technologically advanced components. In 1983 a financial holding company was established to define the objectives and strategies of the group and to coordinate and allocate resources for their implementation. By the early mid-1970s, the Dioguardi enterprises had become a close knit 'group' or 'macrofirm' of autonomous subsidiaries integrating all phases of the building cycle. This period of growth closed with the formation of branches in Brindisi, Rome, and Milan. In these ways the company successfully 'pursued a long-term plan of organizational and market growth to be incrementally and systematically implemented' (p. 19).

During the third period of the company's evolution, from 1976 to 1990, the firm under the guidance of Gianfranco

Dioguardi prospered as a highly respected, fully integrated national enterprise. Because the Italian building market was largely dominated by public agencies, the firm worked closely with such agencies to plan and construct the building of 100 module post offices in southern Italy, and public utility works, airports and other transportation facilities, public housing, schools and churches, rehabilitation of historic urban blocks and landmark buildings as well as housing and industrial facilities for other clients throughout the nation. In the tradition of the firm's commitment to social and community improvement, it pioneered advanced designs for schools, churches, and civic projects. For its urban renewal and reconstruction work, for example, it relied on its itinerant Neighborhood Laboratory, which provided consulting, technical, social and cultural advice and services. Between 1981 and 1990, the volume of sales tripled as the development of innovative building systems and construction techniques, the extensive use of computer-aided design (CAD), and improved management oversight enhanced the enterprise's existing capabilities and competitive strength.

At the end of the 1980s came a leveling off of demand, then a sharp downturn in the business cycle. Next came scandals over the awarding of public contracts, which completely disrupted the construction market in Italy. So the Dioguardi firm turned to the larger European market by setting up subsidiaries in France, based at Lyon, and in Spain at Madrid, and undertaking promotional projects in Seville, Moscow and Prague. At the same time it expanded its portfolio of building and services to include underground garages and R&D laboratories and facilities. These moves, in turn, led at the end of 1991 to the negotiations for a collaborative agreement with the Beacon Construction Company of Boston.

Whereas Dioguardi had from the start combined architectural design and construction, Beacon began as a construction company building for outside clients. Formed in 1945 at the war's end by two brothers, Norman and Robert Leventhal, recent graduates of the Massachusetts Institute of Technology, it concentrated on volume production of public and private housing, the first spurred by military housing as the Cold War intensified, the second by government-supported mortgage insurance programs. From these markets the company expanded into the construction of post offices, military installations, and highway service facilities. These markets led to the development of capabilities in new volume construction techniques as well as in estimating, purchasing, coordinating, subcontracting, and short-term financing in

projects that were being simultaneously carried out in sites scattered throughout the nation.

As the federally funded and insured projects leveled off in the early 1960s, and as the economy of the local Boston area revived, Beacon entered the real estate business as a defensive move to ensure continuing use of its construction capabilities. It began to construct office buildings for the region's new high-technology businesses, and to take part in the renewal of downtown Boston. The move into office real estate development began with its Wellesley Office Park project and other offices with Boston's Center Plaza. At the same time it continued to participate in military housing, post office, and private housing projects. These moves brought new personnel and the development of new capabilities in finance and real estate planning and development. By the early 1970s, the firm began concentrating on the real estate business for its own sake, as it had become more profitable than building construction itself.

In the internal reorganization that evolved after the death of Robert Leventhal, in 1972, this growth led to the creation of four organizational units. At the center, The Beacon Companies (TBC) planned real estate projects, and provided central and financial services, and coordinated leasing activities. The Beacon Construction Company now carried out the building projects that TBC planned. A second subsidiary, Pemberton Management Company, managed the properties once they were completed. A third unit handled the arrangements with equity partners including pension funds, life insurance companies and other large holders of real estate assets. In this way, during the second period of growth from the early 1960s to the mid-1970s, Beacon had, like Dioguardi, created a 'group' or 'macrofirm' of closely related, centrally controlled operating activities.

As in the case of Dioguardi, in the third phase of its history from the late 1970s to the late 1980s Beacon had come of age. The continuing reshaping of downtown Boston and the prosperous years of much of the 1980s provided opportunities to develop, construct and manage a series of new large office building projects and multiunit ones, such as Rowes Wharf on Boston's waterfront, which involved 'uniqueness, high quality, and delivery complexity' (p. 47) in their construction. The company made a major move into the development, building, and then operation of a national chain of business hotels. In the same year, it became, much as Dioguardi, a leader in interior construction and in rehabilitation and renovation projects. All these new businesses resulted in new

and enhanced planning, construction, and building management capabilities.

Then in 1988 a business downturn began that soon became a deep economic recession. The Beacon Companies halted the development of new projects and sold off its hotel chain. As Beacon Construction had drawn over 90% of its work from TBC, it began a search for new businesses. It turned to hospitals and other providers of health care, and to universities with their laboratories, libraries, and dormitories—institutions that periodically made large capital investments but lacked in-house construction capabilities. It continued, using personnel from TBC, to carry out office building, renovation and rehabilitation projects. Like Dioguardi, Beacon began to look abroad. Their mutual search led them initially to work together on a rehabilitation of Bari's leading theater. That collaboration brought an appreciation of the similarity of their two medium-sized enterprises and, more important, the complementarity of the many capabilities that had evolved from their different historical experiences.

For the students of business and industrial history and of strategy, policy and organizational development this study has much to offer. It suggests that the similarities of the successful strategies of growth and the structures developed to implement them during each of the chronological phases of their history reflected the broader worldwide macroeconomic changes—first the period of rapid growth, 'the Golden Years of Capitalism' after World War II, then the leveling off of their nations' growth and productivity in the late 1960s and 1970s, the boom years of most of the 1980s, and the sharp recession at the end of the decade. On the other hand, it also suggests that the different but complementary capabilities that the two firms developed in each of the chronological phases reflected differences in the political, social, and institutional environment within each nation.

What is particularly impressive about this book is the way in which the author has used the historical evidence of the evolution of each firm's core competences to indicate the potentials and the pitfalls of the agreement for collaboration signed in January 1992. He does so by examining the differences in their markets and their position in these markets, and the differences in their organizational structure, not only in the formal allocation of work, but also in internal coordinating mechanisms and information processes, and finally their cultural and social outlook. The potential complementarities, as well as weaknesses, are demonstrated through detailed technical analyses of three of Dioguardi's most

recent projects and three of Beacon's. The final section outlines the ways in which complementarities can enhance the competitive advantage of each enterprise in the increasing global economy through the integration of complementary strengths and reduction of potential weaknesses. I know of no comparable study dealing with strategic alliances that illustrates so well the value of corporate history for analyzing corporate capabilities and the ways they can be used to maintain long-term profitability.

Alfred D.Chandler, Jr.
Strauss Professor of Business History, Emeritus
Harvard University
Graduate School of Business Administration
October 1996

Preface

This book is the first published manifestation of a vision that was formulated by Professor Gianfranco Dioguardi and myself over a series of short informal discussions in Rome, Italy, during a weekend in October 1991. Gianfranco, Managing Director of the Italian-based construction company Dioguardi S.p.A., and I, representing the American firm of Beacon Construction Company, had decided to get together to explore our mutual interests in the organization of the construction industry. More specifically, we were both interested in learning more about our respective firms with an eye to the potential merits of some forms of collaboration across the Atlantic. For each of us the dream of bringing knowledge and creativity to construction and management challenges in different cultures and across national boundaries has been a long-time avocation. For each of our organizations—mid-size construction companies nurtured in provincial environments for well over a half a century—realization of this dream is neither simple nor perfunctory. Nevertheless, in a world characterized by increasing international competition, even at the local level, it is essential for future growth and success.

As this book reports, the realization of our vision of a cross-Atlantic alliance is only in its infancy. It has been delayed by local and international economic changes, both positive and negative. It has been tempered by organizational transformations in each of our companies. It has, not surprisingly, been temporarily subverted by misunderstandings of language and culture. Yet it has been remarkably successful, moving well beyond the preliminary, but very determined, first steps that we took some five years ago. In this preface I wish to highlight three underlying reasons that have allowed us to get this far.

The first is a philosophy that we and our organizations share. It is a philosophy that is built on the intuition and spirit of the founders of our companies, Norman Leventhal and Saverio Dioguardi respectively. The essence of this philosophy is that

human vision drives reality; that when such vision is well intentioned and in the service of others, it motivates people; and that, when motivated, people working together have a unique capability of making dreams come true.

The second reason has to do with a few key individuals. Most important among these is James Becker, President of Beacon Construction Company. Jim not only immediately endorsed the vision developed in Rome but also continually energized the process, ensuring that the critical resources necessary to convert it into reality were provided and sustained. Raymond Levitt of Stanford University, who initially introduced Gianfranco to Jim and me, Marcello Biagioni, who participated in many meetings including the initial October discussions, and Roberto Pietroforte, who authored this book and has 'one leg in each culture,'—all played essential roles.

The third and last reason for the progress of the alliance is the commitment of the talented staff of both Beacon Construction Company and Dioguardi S.p.A. It is they who have transformed a meeting between two strangers in Rome into a working team, which is currently building the Italian Chancery in Washington, DC. It is also they who will convert the teamwork involved in successfully converting this project into a more global collaboration, which will make our ever more widely shared dream a concrete reality.

Henry Irwig
Beacon Management Company
October 1996

Introduction

'Louis, I think this is the beginning of a beautiful friendship.'
(from the movie *Casablanca,* 1942)

The output of the construction industry generally results from the temporary coalition of independent firms. Although experienced in practice, the concept of cooperation between construction firms has not received proper attention in the industry, probably because its benefits are not fully known. This concept, in addition, contrasts with the traditional business paradigm of the industry, characterized by fierce competition and lack of trust, particularly in the USA. The thrust toward cooperative ventures, however, promises to grow in the future. The changing nature of construction demand offers new opportunities, whose attainment is facilitated by the forging of long-term strategic alliances. This book presents the development of the alliance between an Italian and a US construction firm. More specifically it shows the necessary analytical work for building an alliance: the organizational evolution and operational features of the firms involved, their complementary capabilities, and the advantages gained from their combined resources. Because alliances are built on mutual understanding and trust, the cultural challenges faced by the two firms are also discussed.

The issue of cooperation is not new in the construction industry. Joint ventures and temporary associations are widely used for minimizing risks—for example, those deriving from a large or technologically challenging project. The formal consideration of cooperation, however, has generally focused on short-term tactical benefits rather than long-term strategic objectives, such as the competitiveness of a firm. This approach reflects the narrow focus of many construction firms, which are distracted from broadening their vision or setting consistent long-term plans by the continuous variability of construction demand and the risk of their undertakings. This situation is quite understandable, given that the poor performance of a specific project may have catastrophic consequences, because its value often represents a significant part of the yearly sales of a firm.

Fratelli Dioguardi S.p.A. (Dioguardi) is a medium-sized firm that operates throughout the Italian territory and internationally, particularly in France and Germany. Beacon Construction Company (Beacon) is a medium-sized US firm that operates nationally but whose present operations are concentrated mainly in the Boston, Chicago and Atlanta areas. Although construction services are the core business of both firms, Dioguardi prefers projects that enhance its implementation focus, supported by its integrated design and construction capabilities. Beacon is a process-management-oriented firm, whose capabilities are eminently suited to projects of a complex nature and multiphased delivery.

Dioguardi has always tried to expand the boundaries of its home market, located in southern Italy. Its operations in West Africa in the early 1940s, the recent establishment of its French, Spanish and German subsidiaries, and initiatives in Eastern Europe are examples of its international orientation. Beacon, in the last few years, has serviced domestic clients with business interests overseas, and has sought opportunities to serve European companies with interests in the USA. One of its key executives has maintained an extensive range of academic and business contacts in Europe over the last 15 years. Some of the key executives of both companies share a common interest in the management and organization of enterprises, which is reflected in their academic activities, publications and international consultancy. This common ground was the seed of the idea of a possible collaboration between the firms. In January 1992 an agreement, whose contents are shown in the Appendix, was signed. The intent of this agreement was to enhance the competitiveness of the firms and expand their business opportunities through reciprocal representation, marketing and consulting.

This official act was followed by several actions, such as the temporary exchange of personnel, reciprocal assistance in the execution of individual projects, and local representation in the marketing of services and products. These initiatives were useful for two reasons. First, they were the occasion for understanding and reconciling the inevitable differences in terms of languages, time frames and working procedures that characterize an international collaboration. Second, they offered the opportunity for assessing, validating and defining the possible complementary capabilities of the firms. At present, both firms are undertaking their first joint project in the USA, and are actively seeking additional joint opportunities, both domestically and internationally. Both firms are aware of the long-term challenges represented by the cultural, business and

technological differences of the European and US construction markets.

The first objective of this book is to advance the strategic importance of international alliances between construction firms, particularly in terms of marketing and local representation, sharing of technical and managerial expertise and systems, procurement of physical and human resources, and awareness of developments beyond the local environment of the firms. The synergistic benefits of durable cooperative relations, such as shortened learning curves and expanded capabilities, are particularly important for medium-sized firms such as Dioguardi and Beacon, whose specialized market is generally geographically constrained, and whose survival and success may be threatened by the entrance of large multinational firms with greater resources and more integrated capabilities.

The second objective is to further develop the basis for the ongoing cooperation between the two firms. Any international alliance entails mutual understanding and agreement in enhancing the competitiveness of each firm in its own market and expanding business opportunities for both firms internationally. An effective alliance, at the same time, builds upon a shared awareness of the corporate cultures and functioning of the firms, their complementary capabilities, and the market areas in which synergies from shared resources are maximized and economies are achieved.

I am painfully aware of the limits of this small book. Besides the satisfaction of the partners, it does not offer any economic justification for the benefits of the alliance, nor does it develop any theoretical framework that systematizes the cultural, economic, organizational and management aspects of an international alliance. The book is a series of notes of a journey that started with my detached observation of the alliance development and ended with my active and emotionally involved participation in the venture. This book is part of the alliance team's efforts to develop a successful cross-cultural experience. I hope that my account of this experience will be helpful to the construction community.

The book is broken down into seven main parts. Chapter 1 introduces the context in which Dioguardi and Beacon operate: namely, the current and future opportunities offered by the construction market at large, and the cultural and organizational characteristics of their national environments. Chapters 2 and 3 analyze the historical evolution of the two firms, as they successfully adjusted to the opportunities and challenges of their changing environments, and outline the

progressive acquisition of their capabilities. Chapter 4 compares and expands the findings of the previous chapters by discussing the strategic orientation, market positioning and organizational structure and functioning of the firms. Chapter 5 focuses on the operations of the firms, by analyzing six recent projects that represent some of their technical and management capabilities. The opportunities created by changing demand for construction services, both domestically and internationally, are presented in Chapter 6. The challenges and advantages of international alliances and the steps for their development are briefly illustrated. This context sets the stage for Chapter 7, which discusses the main features of the ongoing alliance: complementary capabilities, joint opportunities, cultural challenges and the lessons learned from this successful experience.

This book would not be a reality without the support of Fratelli Dioguardi and Beacon Construction. Many people have made valuable contributions to the study during extensive interviews and visits to construction sites. I am particularly grateful to Gianfranco Dioguardi, Nicola Costantino and Giuseppe Colombo of Fratelli Dioguardi, and to Norman Leventhal, James Becker and Henry Irwig of Beacon Construction for their unfailing cooperation and generous help. Last, but definitely not least, I am indebted to Ellen Shapiro for her expert editorial assistance. Of course, I alone take responsibility for any shortcomings of this book.

1 Market opportunities and environments of the firms

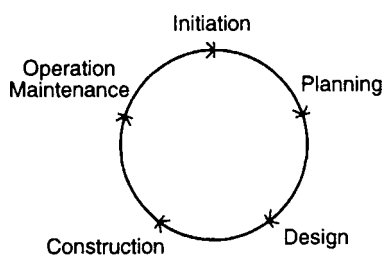
The operational context of Beacon and Dioguardi is introduced in this chapter by describing the current business opportunities that result from the various functional phases of the building process, and the new challenges following changes in construction demand. The major characteristics and differences of the US and Italian construction industries and processes are also highlighted. The awareness of these differences is important for understanding the historical evolution of the firms to be analyzed in the following chapters.

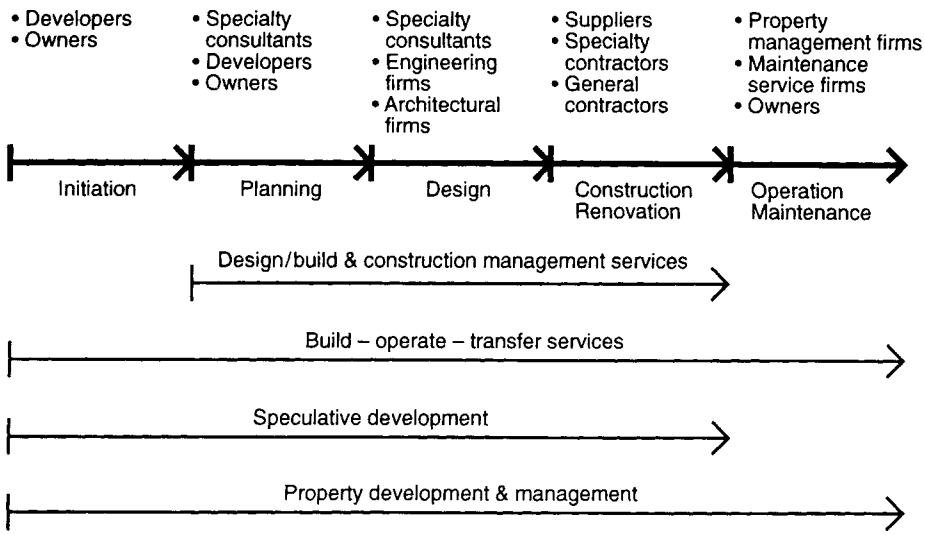
The construction market: current opportunities

For explanatory purposes, the building delivery process—the environment of the construction market—is compared to a multiphased input-output cycle, as shown in Figure 1.1.

At each phase the value of the preceding input is accrued by embodying knowledge, capital and human resources in the output. The process is initiated with the perception of a need or investment opportunity that, later on, is followed by its transformation into a set of objectives and tasks for meeting these objectives, such as land acquisition, project scope definition, financing and a project delivery program. The design phase involves the transformation of objectives and plans into a set of graphic representations and construction specifications. Construction is the transformation of these documents into physical reality. Note that this phase may be characterized by the construction of a new building or the renovation of an existing one. After completion, the output of the building is the service to users and/or a stream of revenues for an investor. Over the years this output degrades or shrinks progressively, notwithstanding maintenance and upkeep interventions. Functional or economic obsolescence reaches a point when a new building or substantive renovation is needed. Roughly speaking, the process described above is broken down into five main phases: initiation (need/opportunity), planning, design, construction/renovation and operation/maintenance. With few exceptions the various activities of each phase are undertaken by independent firms, thus creating different

1.1
The cycle of the building delivery process.





1.2
Market segmentation by phases of the building delivery process.

market areas by phase and by specialties within each phase, as shown in Figure 1.2.

Until not long ago, the general contracting business was identified with sales from construction and renovation operations only. Within this market, many specialties exist by type of project and construction technique. Competition is generally based on price for a given level of construction quality. Contracting firms consequently have developed a 'production' culture aimed at achieving production and operational efficiencies for competitive reasons. These objectives have induced some firms to integrate backward with their supply sector, e.g. materials, parts and machinery, in order to decrease input costs. Given the downstream positioning of the construction and renovation phase in the business cycle of the building process, contracting firms have little opportunity for influencing or creating the demand for their new projects without entering or controlling other phases. In this regard, some firms have moved upstream in the process by incorporating design/ engineering capabilities (e.g. through acquisition, in-house development or temporary associations) and/ or offering design/build services. Lastly, some firms have created new demand by being involved in real estate development, e.g. housing and commercial buildings, or more recently building-operate-transfer projects.

The construction market: future opportunities

This pattern has been changing. Macrochanges in the world economy at large, and the construction market in particular,

are creating new opportunities for forging alliances between construction firms, particularly those of medium size.

Developments in information processing and telecommunication technologies, global procurement of materials and equipment, improved transportation infrastructures and internationalization of financial markets allow firms to enter new markets by operating worldwide. The collaboration with local firms is essential for understanding local markets, cultures and technologies without the need for significant investments, such as the opening of a local subsidiary, and for developing the awareness of the competitive requirements of the global economy.

At the same time the need for creative project financing (required by privatization programs and lack of public funds) and real estate and facilities operations and maintenance is expanding the traditional opportunities of the construction industry. Its market has been characterized by an increasing demand for broad management services to be offered early in the building process in addition to traditional construction services. The increasing complexity of projects with regard to both phasing and technology requires capabilities to cooperate with different specialized organizations and/or to deliver total and multidisciplinary services. These new challenges can be met if construction firms can develop technical and integrative management capabilities applicable to the entire building process, and a professional service attitude instead of a production-oriented culture. These capabilities should be supported by the increasing involvement of construction firms early in the development of new projects.

The scenario described above tends to favor large and integrated firms. Established cooperative and value-added linkages among small or medium-sized specialized firms, however, allow them to reach a competitive position, by having a superior organizational flexibility for project- and resource-transferring capabilities while maintaining efficiency of specialization and autonomous operating effectiveness. This organizational arrangement, in which independent specialized firms pool together their resources along the value-added chain of a product, has been described as 'networks' (Miles and Snow, 1986; Thorelli, 1986) in the manufacturing and services sectors, and in the case of the construction industry as 'quasifirm' (Eccles, 1981) or 'macrofirm' (Dioguardi, 1983).

The current environmental problems, the prospects for success of sustainable development, and the changing relationship between environment and mankind are other issues that foster domestic and international cooperation between

firms and communities, because little is known about the management of the environment. In this regard, the construction industry as a whole needs to develop a stronger social role and cooperation and to improve its tarnished image as one of the main sources of environmental problems.

The environments of Dioguardi and Beacon

Dioguardi and Beacon operate in an industry that in the last 40 years has been losing importance vis-à-vis other sectors, such as services, in terms of contribution to their respective national economies. This pattern is typical of highly developed economies, such as those of the USA and Italy, with a shrinking new construction market and a growing maintenance and repair construction sector (Bon and Pietroforte, 1990, 1993; Pietroforte and Bon, 1995).

Construction is a mature industry, whose market is characterized by fierce competition among firms. The rules of competition are set predominantly by the client and the client's consultants in the form of procurement and bidding approaches and contractual arrangements. The criteria according to which the demand for construction-related services are defined and communicated and their supply is controlled, strongly influence the behavior and culture of construction firms in the long run. These issues are reflected in the characteristics of the Italian and US construction markets to be discussed in the following pages.

The value systems of the firms' environments are different, although both share capitalistic features in their economies. Society in the USA is characterized by a thrust toward the enhancement of individual liberties, entrepreneurship and ethical values, while Italian society is characterized by an emphasis on social equality, public welfare and moral values. Some of these traits are reflected respectively in the personalities of the principal owners of Beacon and Dioguardi: Norman Leventhal, whose reputation builds upon his entrepreneurial achievements, and Gianfranco Dioguardi, whose reputation builds upon his social and cultural contributions.

The different value systems are also reflected in the labor market. The Italian context is characterized by rigid employment regulations, a significant employment role of the government, generous social benefits, and lack of job mobility. The US labor market, however, is characterized by more flexible employment regulations, a significant employment role of the private sector, and job mobility. These features are reflected in the US economy, which is generally more dynamic than in Italy.

Other important differences can be discerned in the business culture and procedures of the two countries. Italian corporations are generally characterized by long-term goals, continuity of employment, and less job specialization. US corporations are geared toward short-term goals and are characterized by a higher rate of employment turnover and job specialization. Business agreements in Italy tend to be based on general understandings and socialization with less reliance on contractual definitions, while in the USA business agreements are often completed with complex legal documents that often prevent the development of flexible procedures during their execution. Italian construction firms are more inclined to form alliances or joint ventures to build relatively small projects. Cooperation is also developed for complying with the requirements of the public building procurement system. US firms are less prone to long-term liaisons because of the fiercely competitive nature of their market. Italian construction firms, even those of modest dimensions, have a tradition of operating abroad because of the limited size of their national market.

The Italian construction market

The demand for construction services in Italy is dominated largely by public agencies, whose activities absorb 40% of the national economy. The state, in addition, strongly influences the housing sector, which accounts for 50% of construction demand, through grants and subsidized financing. The combination of public work, projects initiated by other state agencies (that are not classified as a public work) and subsidized housing, absorbs approximately 70% of the total fixed capital investments in construction. Over the years, the public sector has distributed construction work with the primary intent of maintaining full employment as opposed to developing efficiency in the industry.

In the 1960s and 1970s the bidding requirements of public projects, based only on competitive prices, have generally induced contractors to seek cost efficiencies rather than qualitative improvement or innovative proposals. The contractual separation of design and construction, in addition, has often negatively affected the quality and schedule performance of public building programs.

In order to overcome the problems of the traditional sequential project delivery process, in the last 15 years there has been a significant use of program management and design/build contracts, with emphasis on the duration and quality of the design/engineering characteristics of projects. This initiative, also

aimed at improving the engineering and management capabilities of Italian contractors, achieved positive results, but at the same time has created abuse and scandals, given the lack of project documentation, resulting in time and cost overruns, and the frequent use of discretionary awarding procedures. The practice of subcontracting has been severely restricted by law in public projects, thus curtailing the growth of firms.

The Italian public procurement system is also characterized by approximately 15000 public or semi-public agencies, which can contract out projects by drawing state funds, but often without accountability to central authorities. Many of these agencies lack the technical personnel necessary to define precise project needs and control the quality performance of these projects. Over the years this situation, combined with obsolete regulations, has hindered the growth of the design profession, particularly in regard to specialization, diversification of services and roles within a building project. Public work is awarded on the basis of documentation that is generally less defined than in the USA, and there is a lack of standard written construction and material specifications (Garaventa and Pirovano, 1994). A 10% payment advance to contractors is normal practice in any project, immediately after the signing of a contract. Given the inefficient public procurement system, until recently Italian construction companies have been operating with profit margins significantly higher than those of other European and US companies.

The Italian construction sector, unlike that in the USA, is still characterized by labor-intensive operations: the large share of maintenance and repair projects (more than 50% of the total construction output), and the craft nature of the construction technologies used, e.g. masonry work, interior partitions, finishes, and plumbing systems. Because of their traditional craft orientation, Italian trades tend to be more versatile than US ones and less prone to jurisdictional disputes and strikes.

The public construction market is changing dramatically, given the recent scandals that have involved major contractors and politicians in charge of public posts. Increasing community scrutiny and lack of public funds will change the nature of the demand, with significant impact on the modus operandi of the market and the strategic orientation of firms.

The US construction market

In the USA the demand for public work plays a less important role in the market than in Italy (approximately 25% of the US

total construction output). This results from the long-standing policy toward an economy regulated by market forces rather than by federal or state intervention. In the USA this orientation is reflected in a pervasive entrepreneurial culture, and the private ownership of many social services that are state-owned in Italy. In this context, private clients have a dominant role in shaping competition in the construction market. The private demand for construction services tends to be very sophisticated, particularly in regard to the definition of required performance and procedural criteria. Emphasis on time and cost control, and the clear allocation of responsibilities and risk, are typical examples.

The US project delivery cycle tends to be shorter than the Italian one, because of the tendency to overlap the design and construction phases, particularly in commercial projects, and also the use of a significant amount of prefabricated components at construction sites. It is more complex than its Italian counterpart from the organizational and procedural point of view as well. This last feature reflects the involvement of entities, such as financial institutions, insurance companies, equity investors, regulatory agencies and communities, which in Italy generally play a less important role in shaping the scope of a project. It also reflects the multitude of specialized contributions to the design and construction phases of a project, where several independent consulting firms and tens of contractors may need to be coordinated. The successful delivery of a project strongly depends on the management capabilities of the contractor and the close involvement of the client in the project team. Although the different interests of the parties involved in a project are generally solved with team-based approaches and the careful wording of contractual arrangements, liability issues are a major problem, with frequent lawsuits arising.

Over the years, the fragmentation of the process and the clients' need for better control and flexibility have given rise to a new function, that of program and construction manager, in assisting the client in all phases of a project. This new type of demand is reflected in the progressive reorientation of innovative construction firms that started to offer broader process management services in addition to traditional construction services.

Conclusion

This chapter has outlined some of the opportunities offered by the changing nature of the construction market,

characterized by an increasing need for broader management expertise and expanded services, beyond the traditional execution capabilities of construction firms. Small/medium-sized firms can take advantage of these opportunities by forming alliances based on complementarities and aimed at expanding their markets and capabilities. In addition, this chapter has discussed the cultural and organizational differences in the respective environments of the firms. The Italian construction market tends to be largely influenced by the public sector. Construction firms are characterized by a production-oriented culture, nurtured by inefficient public procurement systems, the use of craft-based technologies and a highly skilled work force. The US market, instead, is largely influenced by the private sector, which is more sophisticated in terms of definition of its requirements and control of their fulfillment. Private demand puts emphasis on services capabilities, particularly in terms of coordination of multifaceted projects and specialized contributions. The description of these two different environments sets the basis for understanding the evolving organizational and operational settings of the two firms that will be analyzed in the following two chapters.

2 The historical evolution of Fratelli Dioguardi

This chapter and the following one analyze the major evolutionary phases of the two firms, from their founding to date. The major theme will be the shifts in business strategy and organizational structure as both firms adjusted to the changes in the environment in which they operate, and the opportunities or challenges caused by these changes. For this purpose, the history of the firms is broken down into phases that reflect major strategic evolutions in relation to market objectives and learning experience, i.e. the development of capabilities for meeting these objectives. The historical analysis takes a contingency view of organizations (Lawrence and Lorsch, 1967): that there is a relationship between the external environments in which successful firms operate and their structural and procedural characteristics.

The history of Fratelli Dioguardi spans more than 80 years characterized by a progressive evolution from a local and craft-based firm to a European-oriented and innovative company through succeeding generations of a family steeped in building. This successful transformation is the result of the current managing director's strategic vision aimed at the systematic improvement of the organizational strength of his firm and the expansion of its market. The implementation of these two goals is the main narrative line of the firm's evolution. From this point of view, the history of Dioguardi is broken down into four phases, which represent milestones in terms of market and organizational growth. In reality, Dioguardi's history, particularly after 1961, should be interpreted as a continuum: the managing director's laboratory for systematic organizational efforts and experimental projects (Dioguardi, 1982, 1986).

In the first phase (1913–1961), the firm's activities are strictly linked with the professional architectural career of its owner, Saverio Dioguardi. In this period the firm undertakes high-quality design/construction projects for clients of the Bari region. High-quality construction work and design capabilities will become a benchmark of the firm.

The second phase (1961–1975) coincides with the

progressive development of the organizational structure and procedures, thanks to the continuous efforts of its new managing director, Gianfranco Dioguardi. The firm expands its market at the national level by engaging in competitively bid construction work, in addition to its traditional design/build projects. Differentiation and integration supported by a strategic plan are the main thrusts of the firm's evolution.

In the third phase (1975–1990), Dioguardi becomes a fully diversified and integrated company with the growth of its branches and subsidiaries. Organizational strength and synergetic capabilities become a major corporate asset. R&D functions are developed to increase specialization. Dioguardi undertakes a long series of culturally oriented projects and social initiatives aimed at enhancing its participative role within the social/cultural context of its operations. In so doing, Dioguardi develops additional unique corporate characteristics, which differentiate the firm from its competitors.

The last phase (1990 to the present) sees Dioguardi successfully projected toward the European market.

Phase 1: The establishment of a design-driven construction firm, 1913–1961

The company was founded by Nicola Dioguardi in Bari with the original name 'N.Dioguardi e Figli' (N.Dioguardi & Sons) in 1913. Bari, the largest city of southeast Italy, has a long tradition of maritime and commercial activities, and is the capital of the Puglia region, an area characterized by extensive agriculture and, until recently, by economic underdevelopment and emigration. The successor to the family business, Saverio, was educated as an architect. A frequent traveler with cultural contacts in the more developed northern Italian architectural community, he was soon involved in international design competitions (e.g. St. Petersburg, 1911; Chicago Tribune, 1922). His strong interest in practicing architecture became a trademark of the firm. By combining the dual function of designer and builder, Saverio Dioguardi was able to fulfill the dream of many architects: a tight quality control of the physical transformation of design ideas. This goal led the firm to work only on the basis of in-house designed projects. In this regard, the owner often acted as an entrepreneur, architect and builder by offering the full gamut of building-related services, from site acquisition to turnover to the client, on the basis of turnkey contractual arrangements. The firm thus targeted the high end of the market and negotiated contracts. This approach resulted

from Saverio Dioguardi's fiduciary relationship with clients and his prominent professional status within the closely knit business and social community of Bari.

Building upon his professional success, in the 1920s and 1930s the firm was involved in the construction of prestigious residential and office buildings and banks that today are considered part of the modern architectural heritage of Bari. Some of these buildings were owned by the firm and leased out, thus creating a second source of revenues. A third source of revenues was found in architectural and urban planning services offered by the in-house technical staff providing services to owners. In the period 1937–1943 the firm expanded its operations in the Italian colonies of East Africa by building housing and banks and providing urban planning services. After World War II the firm progressed in the fields of both construction and planning by expanding regionally. Major projects were completed for banks, the national telephone agency, religious orders and elderly home institutions, as well as the Bari Levante Fair. Table 2.1 lists the major projects, by type and geographic location, that were executed in the 1913–1961 period.

Organizationally speaking, the firm was built around the charismatic figure of the owner, who supervised operations and maintained external contacts. The simple and centralized organizational structure was characterized by an absence of formalized working procedures. It consisted of a small core of assistants to the owner (accounting, payroll, design and operations) and a professionalized construction force with a

Table 2.1 Major projects, by type and geographic location, executed 1913–1961

Main projects before 1943:
High school (Bari)
Residential buildings (own account and outside clients, Bari)
Public housing (Bari; East Africa)
Office buildings (newspaper and insurance company, Bari)
Construction and/or renovation of bank buildings (Bari; East Africa)
Buildings for religious orders (Bari)
Telephone exchange center of Bari
Pavilions at the Bari Levante Fair
Main projects after 1943:
Construction and/or renovation of bank buildings (Bari and Puglia region)
Telephone exchange buildings (Bari and Puglia region)
Residential buildings (Bari)
Office buildings (own account and insurance companies, Bari)
Buildings for religious orders (Bari)
Pavilions at the Bari Levante Fair
Building work industrial zone of Bari

wide delegation of authority in terms of technical and purchasing matters. Coordination and training of personnel were obtained through direct supervision by and personal relationships with the owner. Because it was aimed at high-quality work, the firm developed a production- and technical-oriented culture, with less attention to control procedures. This approach was nurtured by the nature of negotiated contracts and a selected pool of clients willing to pay a premium for high-quality projects. Figure 2.1 shows a typical quality-oriented residential project.

The evolution of the firm and the type of executed projects underline the following learning experience.

2.1
Residential building in Bari.

Creating a market niche

Because of the personal interests of the owner, the firm differentiated itself from other competitors by offering only combined design and construction services. The local professional preeminence (probably the leading Bari architect in the mid-1930s) and social connection of Saverio Dioguardi allowed the firm to obtain work on the basis of fiduciary relationships. This approach led to a locally limited market with a small core of repetitive clients, such as banks and the national telephone agency. By controlling design, in addition, the firm was able to tailor projects as a function of the technical competence of its workforce. Design capabilities and repetitive clients would become two of the main features of the firm.

Building a social image of the firm

As a prominent Bari citizen with vast cultural interests, Saverio Dioguardi was sensitive to the social needs of his community. In 1923, for example, the firm covered almost 50% of the construction cost of a monument dedicated to the soldiers fallen in World War I. This initiative was the first of a series of community contributions that shaped the present image of a socially concerned firm.

Construction quality and detail

A core of specialized construction workers, masons, plasterers and carpenters was the main resource for successfully meeting three main challenges: the quality requirements of the targeted high end of the market, the craft nature and complex detailing demanded by the architectural style of the projects of that period, and the equity interests that the firm had in some projects. The motivation of these trades was sustained by the long-term employment policy of the firm.

Phase 2: Reorganization and growth—setting the basis for a nationally oriented firm, 1960–1975

In 1961 Saverio Dioguardi died at the age of 73, leaving the family business with an uncertain future. The firm, in fact, was built around his charismatic personality without any formalized organizational structure or any personnel with his management and technical capabilities. Giuseppe and Gianfranco, two of the sons who took over, did not have specific construction or

management experience. The early 1960s, therefore, were characterized by the inevitable soul searching aimed at developing the role of the two brothers within the firm, planning its reorganization and defining its new mission. Giuseppe would be in charge of business development and external contacts, while Gianfranco, the youngest child of the family and an engineering student, would reorganize the firm's administration and operations, a task that would require a very long learning effort. The young manager would treat the firm as a kind of laboratory for continuous organizational studies and experiments. Through this experience, Gianfranco would become a leading national figure and academician in the area of management and organizational theory.

The survival and success of the firm was one of the first tasks undertaken by the young managers. It was decided that, once the firm was stabilized, a growth policy should be pursued, given the limited opportunities of the local market. This strategic approach was to be achieved through five long-term objectives.

Stabilization of the firm's operations and external relations

The development of good labor relations was pursued by sponsoring safety programs to be fully delegated to construction superintendents. The existing clients, e.g. banks and the national telephone agency, were maintained by offering the same high-quality construction standards of the past and undertaking maintenance projects, although this type of work was of small scale and unprofitable.

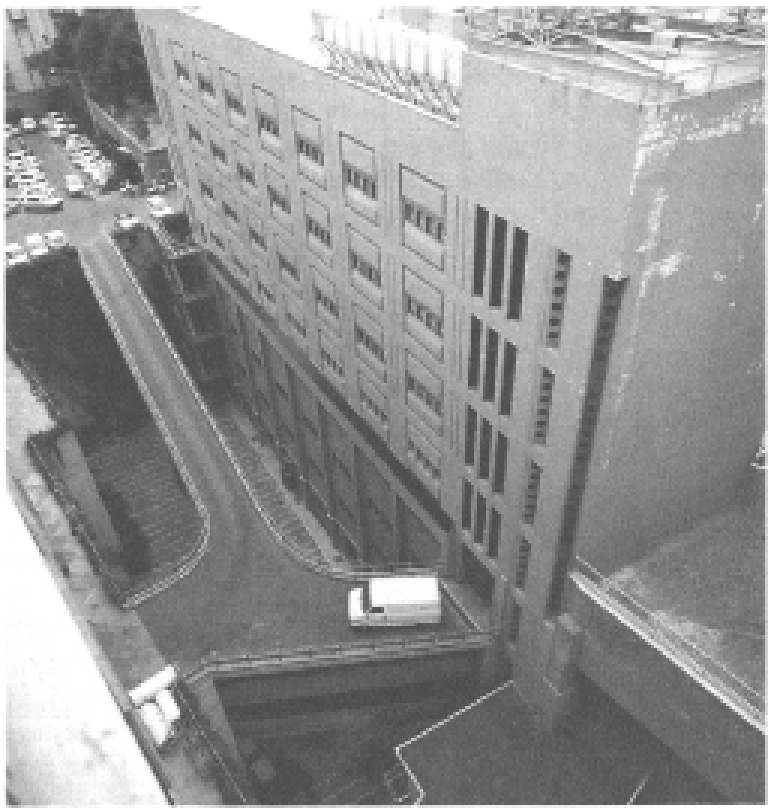
The development of a new organizational structure

Formalized working procedures, particularly in terms of cost accounting and control and construction management, were developed. In order to have overall supervision and coordination of production, the position of technical general manager (a kind of chief operating executive) was created. This new function, with a considerable delegation of authority, was performed by an outside consultant on a part-time basis. Although dictated initially by a contingent situation, delegation of authority would become a systematic approach in the future successful growth of the firm.

Expansion into new markets

Although stimulated by state-subsidized programs, the market of Bari's region was too limited for the design/construction

services offered by the firm. Growth was to be pursued by entering the contracting of public and private projects, and seeking work in other regions by subcontracting part of the work. To this end, estimating, purchasing and cost control functions were to be created. The development of these functions was crucial for success in the competitive bidding climate and for controlling the subcontracted work. In this regard, the firm had had experience only with negotiated contracts, where cost factors receive far less attention. Geographic expansion was initiated by opening a branch in Naples in 1970 with the ultimate goal of establishing a presence in the more sizable central and north Italian markets. This approach would improve work opportunities and allow the establishment of economies of scale, impossible in the local market, and to develop experience in more competitive areas. Dioguardi had the tradition of undertaking construction work with its own forces in the Bari region, a practice that is still used today. The reader should be aware that in the following years, the practice of subcontracting in public projects was



2.2
SIP telephone exchange center in Naples.
(Photo by Roberto Pena)

severely restricted by Italian legislators. Figure 2.2 shows a telephone exchange center, one of the first projects completed by the Naples branch in the early 1970s.

Development of product and process innovation capabilities

Technological specialization entailed the development or promotion of R&D functions. This approach resulted from the firm's need to rationalize production and decrease the cost of repetitive projects such as telephone exchange centers, schools, and bank branches with which the firm has had experience. If properly designed, repetitive projects were amenable to be broken down into standardized and prefabricated building components. This approach entailed the strengthening of in-house design functions and the development of specific production capabilities. In 1969, ICP, a subsidiary with engineering and production capabilities for prefabricated concrete components, was established. The initiative also reflected the broader need for improving the productivity of the Italian construction industry in the 1960s, whose production was still craft based and inefficient to a large extent. In the following years, prefabrication and other industrialized construction methods were stimulated through several state-sponsored programs of residential and school projects.

Development of a training function for management personnel

The opening of subsidiaries and branches would entail delegation of authority to executives with entrepreneurial and management capabilities, who initially were not available in the Bari area. Key personnel would be trained through personal and academic contacts with Gianfranco Dioguardi. He is a leading professor of industrial organization at the University of Bari and the author of several books on this topic that have brought him national attention. A new external entity was to be developed as a bridge between the academic and professional world and the inner context of the firm and as a sponsor of research studies on management, conferences, training programs and publications. In 1975 GRM, an independent management consulting and research center, was established. GRM focuses on the organizational problems faced by Italian firms, particularly the medium-sized ones operating in southern Italy. It offers consulting services, such as management training, to local communities, as is documented by a long string of published documents, and contributes to the management efforts and research projects of the firm.

In 1963 the firm was incorporated with the new name 'Fratelli Dioguardi'. Because the residential market was still strong, the firm kept this line of business by developing several company-owned urban sites in Bari. The traditional market with banks and telephone agencies was expanded. The projects of the 1970s were technologically more demanding than those of the 1950s and 1960s. The use of sophisticated security and mechanical systems, data processing and telecommunication systems entailed new construction procedures (in the case of new buildings), and/or their integration with old masonry technologies (in the case of intervention in existing historical buildings). The firm was also successful in obtaining contracts for industrial projects such as print shops, gas stations and liquid gas bottling facilities.

Table 2.2 lists the major projects by type and geographic location that were executed in the 1961–1975 period.

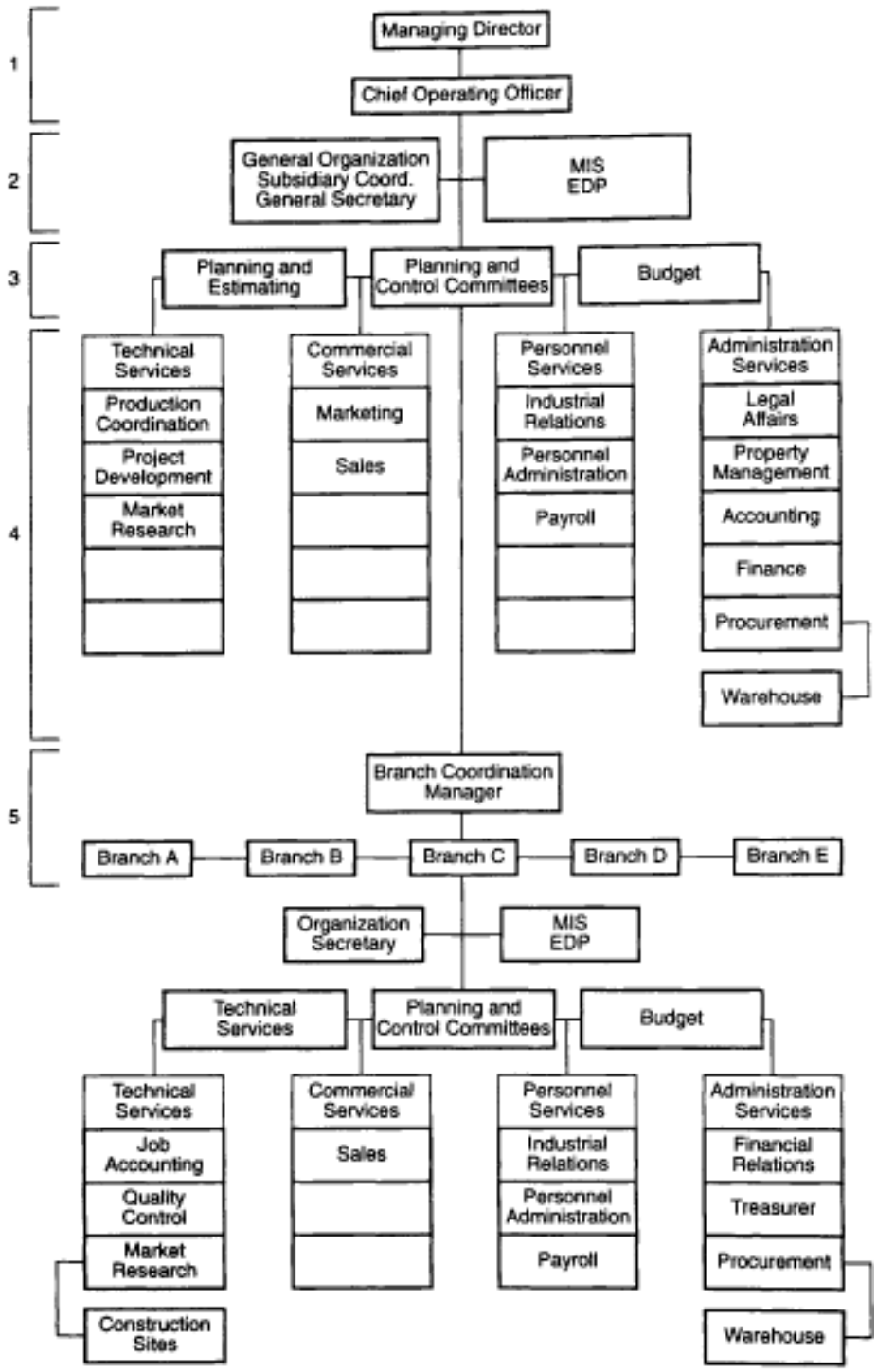
At the end of the 1960s the residential market, particularly the high end pursued by Dioguardi, evaporated because of the economic recession, the saturation of demand and the introduction of more stringent zoning regulations. Dioguardi stopped being involved directly in this line of business by creating three subsidiaries in 1969: OCEI engaged in real estate development and marketing, and SID and ORIANA in managing the properties of the firm.

This action was the first of a series of moves that led the firm to concentrate on the core business of construction and externalize functions such as financing, real estate, design and planning, plant engineering and production of building components. The establishment of new organizational entities and subsidiaries between 1969 and 1974 transformed Dioguardi from a construction firm with many internalized lines of business into a group of autonomous firms that are integrated throughout the building cycle.

In 1973 Fingruppo, the financial holding company in charge of defining and coordinating the objectives and strategies of the group, was established. This initiative was followed by the 1974 creation of EGECON, a company with a focus on design

Table 2.2 Major projects, by type and geographic location, executed 1961–1975

Telephone exchange centers (22, Bari, Naples and Matera)
Construction/refurbishment of banks and data processing centers (14, Bari and Naples)
Residential buildings and elderly housing (Puglia region)
Office/residential buildings (three, Bari, two for own account)
Major gas stations (three, Puglia region), print shop and liquid gas bottling facility (Bari)
Miscellaneous renovation and restoration projects (Bari and Naples)


1
2
3
4
5
Managing Director
Chief Operating Officer
General Organization
Subsidiary Coord.
General Secretary
MIS
EDP
Planning and
Estimating
Planning and
Control Committees
Budget
Technical
Services
Production
Coordination
Project
Development
Market
Research
Commercial
Services
Marketing
Sales
Personnel
Services
Industrial
Relations
Personnel
Administration
Payroll
Administration
Services
Legal
Affairs
Property
Management
Accounting
Finance
Procurement
Warehouse
Branch Coordination
Manager
Branch A
Branch B
Branch C
Branch D
Branch E
Organization
Secretary
MIS
EDP
Technical
Services
Planning and
Control Committees
Budget
Technical
Services
Job
Accounting
Quality
Control
Market
Research
Construction
Sites
Commercial
Services
Sales
Personnel
Services
Industrial
Relations
Personnel
Administration
Payroll
Administration
Services
Financial
Relations
Treasurer
Procurement
Warehouse

and planning and construction management services. Construction capabilities were developed further by establishing SOGEI, a subsidiary that specializes in the engineering and installation of technologically sophisticated components such as mechanical and solar systems. In order to facilitate the penetration into the market of Brindisi, Dioguardi established ICIM SUD, a company that operates in the area of industrial and civil engineering work.

The establishment of all these subsidiaries started the differentiation and integration process that would have improved the specialization capabilities of the firm particularly in regard to know-how (e.g. EGECON and real estate subsidiaries), market (ICIM SUD and branches) and products (ICP and SOGEI).

At the end of 1974 Gianfranco Dioguardi also took over the management functions of external relations. This move was possible because internal operations had achieved a satisfactory level of performance through an efficient use of training and delegation of responsibilities. In 1975, the branches of Rome, Milan and Brindisi were opened, thus completing the geographic expansion plan. In the middle 1970s Dioguardi completed a remarkable evolution from a small entrepreneurial firm with local and centralized operations to a medium-sized integrated contracting firm with decentralized operations at a national level that seeks continuous technical improvement and growth. Notwithstanding this significant transformation, the firm maintained its original features of quality work, design/ build capabilities and social participation.

Figure 2.3 illustrates the organizational model along which the construction firm was being structured during the years 1970–1975. This model, a kind of reference context for organizational changes and additions, will go through many transformations in the following years.

The evolution of the firm underlines the following learning experience. The fierce competition and the cyclical nature of the construction market generally induce construction firms to pursue short-term goals of profitability and market share. Over the years this approach creates a reactive rather than proactive corporate strategy. Dioguardi, on the contrary, pursued a long-term plan of organizational and market growth to be incrementally and systematically implemented. The plan started during the stabilization period of the firm (mid-1960s) by improving its organizational structure through the development of new administrative functions and formalized procedures. The firm then created a series of subsidiaries for diversifying business risks and improving market opportunities. In this last regard,

2.3
Dioguardi's organizational model during the 1970–1975 period.

Dioguardi is characterized by five organizational levels. Beneath the managing director (Gianfranco Dioguardi) and chief operating executive level, there are the general secretary and assistantship resources, used also for the coordination of the firm with the other subsidiaries, and an information/data processing center. In this last regard, the continuous availability of information and systematization of data and procedures would become an important tool, given the growth and divisionalization program of the firm.
At the third level there are the planning and control units of operations. Together with special committees, these units are in charge of bid preparation, budgeting and cost control. The formalization of these functions received particular attention, given the fact that Dioguardi was going to be involved in competitive bidding, where cost efficiencies and control were very important.
The fourth level is composed of four functional departments: operations (technical coordination and design/ planning), sales and marketing, personnel and administration (legal, accounting, finance and purchasing). It should be noted that the chart was developed at a time, approximately 1970, when real estate activities had not yet been fully externalized. For this reason sales, marketing and legal functions were still quite developed.
The last level is formed by the coordination office of the local branches (a function undertaken by the chief operating executive) that are in charge of construction projects and real estate sales. The branches have the characteristics of autonomous centers by duplicating many of the functions of the headquarters. The emphasis on full autonomy would create organizational problems to be corrected, later on, by putting branch operations under the supervision of the general manager (chief operating executive).

the design and real estate subsidiaries were crucial strategic components. They fostered demand for construction work and 'shaped' the same demand as a function of the firm's technical capabilities. Differentiation was accompanied by a process of integration. Each subsidiary specialized in a phase of the building cycle, and their cooperation created synergies that benefit the overall capabilities of the firm. The establishment of subsidiaries and branches was implemented through a process of delegation that, in its turn, entailed the availability of management personnel with common entrepreneurial and professional skills. Human resources development and training, therefore, became an important strategic goal of the firm.

Phase 3: Becoming an established nationally oriented and integrated firm, 1976–1990

In the mid-1970s Dioguardi's diversification and divisionalization plan was implemented in three major directions:

- the completion of market expansion through the effective take-off of the Rome and Milan branches and other subsidiaries, the offer of services to those existing clients who operated on a national basis, e.g. SIP, the telephone agency, and the acquisition of new prestigious repetitive clients, e.g. ITALPOSTE (state agency that oversees all mail services), ENEL (state power utility) and SEA (agency that oversees Milan airports);
- the initiation of a series of research initiatives and experimental projects aimed at developing additional specialization and differentiation from competitors;
- the continuous evolution and refinement of the organizational structure through the incorporation of new functions, the hiring of key executive managers, and the development of formalized procedures, such as job descriptions and functional responsibilities, protocol and communication criteria.

In this period, Dioguardi's operations focused on five types of construction projects, some of which were designed in-house or by hired well-known design consultants. Some of the office and residential projects were promoted by the real estate subsidiaries.

- Public and private housing projects and residential related services, such as schools and churches. A significant part of the housing projects are characterized by short delivery time

(e.g. six months for an 84-unit project in Bari) through the extensive use of prefabricated components and industrialization of forming operations. A similar approach is used in the construction of schools and churches.

- Service-oriented projects such as post offices and related distribution centers, telephone exchange facilities and banks. The first two types of projects made extensive use of prefabricated components and sophisticated technological systems. The components were produced by the ICP subsidiary in the case of sites close to the fabrication plant of Bari, e.g. the program of approximately 100 modular post offices implemented in the Puglia and Lucania regions. Bank projects, instead, emphasized the use of craft production techniques, given the high-quality finish requirements and the need to operate in existing historical buildings.
- Public utilities and transportation infrastructures such as power plants, sewage systems, aqueducts, airports, railroad lines, highway facilities and roads.
- Industrial facilities such as factories for electronic components and airplane assembly, breweries, depots and maintenance plants for locomotives and buses.
- Renovation projects of historic urban blocks and landmark buildings such as banks, hotels and office buildings. Some of these projects required extensive in-house planning for reconstructing or maintaining the original architectural features of the buildings.

Besides servicing Dioguardi in its design/build initiatives, the EGECON subsidiary is also engaged in architectural and urban planning projects as well as civil engineering projects for outside clients. Table 2.3 lists the major projects, by type and

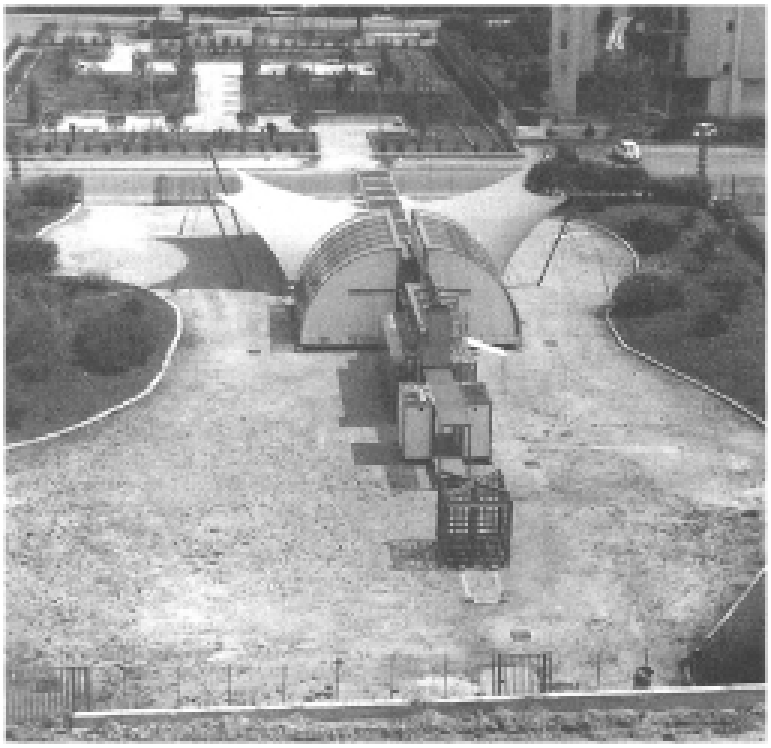
Table 2.3 Major projects, by type and geographic location, executed 1975–1990

Telephone exchange centers and communication related facilities (22, Puglia and Lucania regions, Rome, Naples)
Construction/refurbishment of banks (25, Puglia, Campania and Lucania regions and Rome)
Airport facilities (Milan)
Post offices and related facilities (105, Puglia and Lucania regions, Milan)
Residential buildings (11, Puglia and Lucania regions, Naples and Milan)
Office buildings (Bari and Florence)
Industrial-related facilities (five, Puglia region and Aquila)
Depots of and maintenance plants for locomotives and buses (three, Bari and Rome)
Churches (two), schools (three), markets (two), and commercial mall
Railroad lines and related facilities (Rome region)
Highway infrastructures and related services (North Italy)
Sewage lines (Rome and Brindisi)
Renovation of urban residential blocks (Bari) and banks
Binistar projects (Brindisi and Rome)
Some of the office projects are for own account

geographic location, that were executed in the 1975–1990 period.

EGECON and other subsidiaries, in addition, undertook many special projects and studies aimed at meeting the specialization goals set in the early 1970s and at improving the image of a culturally sophisticated and socially concerned firm. The late 1970s were characterized by a series of feasibility, planning and design studies in the areas of prefabricated telephone centers, solar housing, emergency shelters and school programs. These initiatives led to the development of prototypical units or programs that incorporated the firm's design and construction approaches and represented one of the 'products' offered to clients.

The 1979 Laboratorio di Quartiere (Neighborhood Laboratory) is a more ambitious and experimental initiative in cooperation with Renzo Piano, a leading Italian architect, aimed at the maintenance and improvement of existing buildings in urban areas. The itinerant laboratory, shown in Figure 2.4, may be composed of a technical maintenance assistance section, consultancy on energy-saving matters, urban sociological center and a feedback center of users' effective requirements. The Neighborhood Laboratory, like other



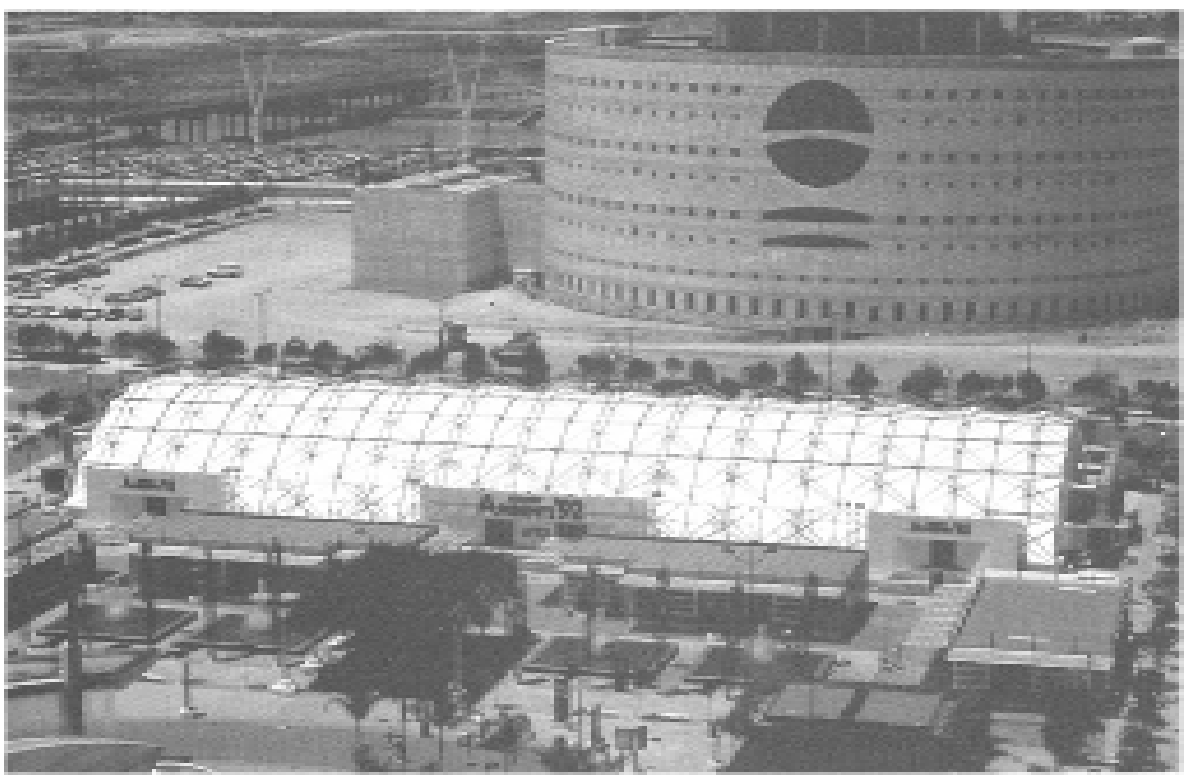
2.4
The Neighborhood Laboratory.
(Photo by Julia)

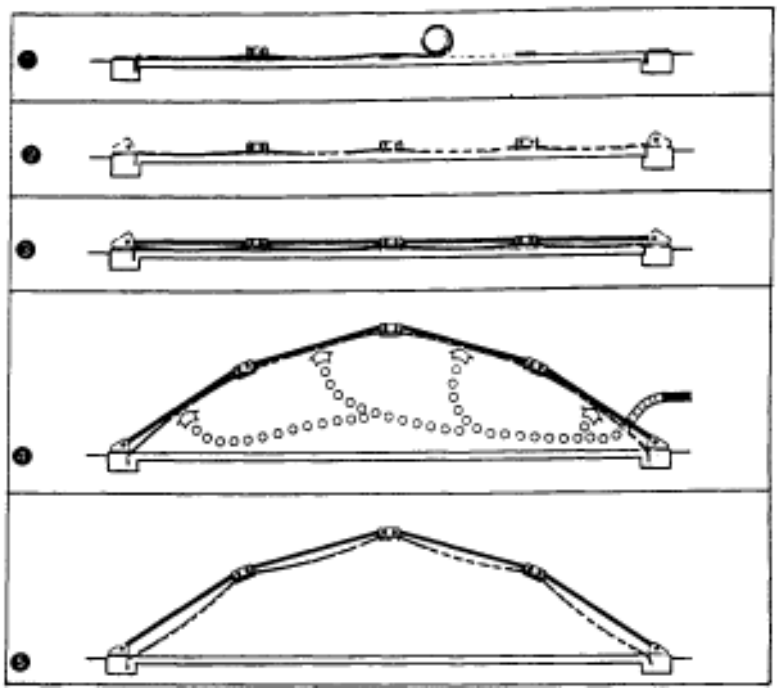
Dioguardi initiatives, reflects the philosophical position that the operations of a construction firm are strictly intertwined with its surrounding social and cultural context.

Through this type of interaction, the Neighborhood Laboratory becomes a 'socio-technological consultancy workshop engaged in research and development for the future of the firm' (Dioguardi, 1983), and in the social and physical improvement of its context. The interests in problems related to maintenance and renovation programs are underlined by a series of research projects financed by the Italian National Research Council.

In the mid-1980s Dioguardi, in association with EGECON, was engaged in the acquisition of patents of two lightweight, long-span structural systems: Binistar, a steel space-frame structure, and Arclatum, an arched roof system of glued laminated timber designed in-house. The Binistar system allows the realization of geodesic structures, of up to 10000m^2, that can be erected and dismantled in a relatively short time, because of its mechanical and pneumatic assembly methods. Figure 2.5 shows one of the four exhibition pavillions at Expo '92 in Seville (Spain) that were constructed with the system. The erection process is shown in Figure 2.6. The pre-assembled

2.5
Binistar system: exhibition pavilion in Seville.





2.6
Erection process of the Binistar system.

space-frame is placed on top of a membrane that, when inflated, raises the frame to its final position. At this point, the nodes of the frames are locked in and the air pressure inside the membrane is released. Both Binistar and Arclatum are presently used for sport, exhibition, cultural and shop activities. The commercialization of these systems was achieved after an intense engineering, testing and development program by the firm. In the late 1980s a new building system for churches, designed by Pierluigi Spadolini and shown in Figures 2.7 and 2.8, was successfully experimented and marketed.

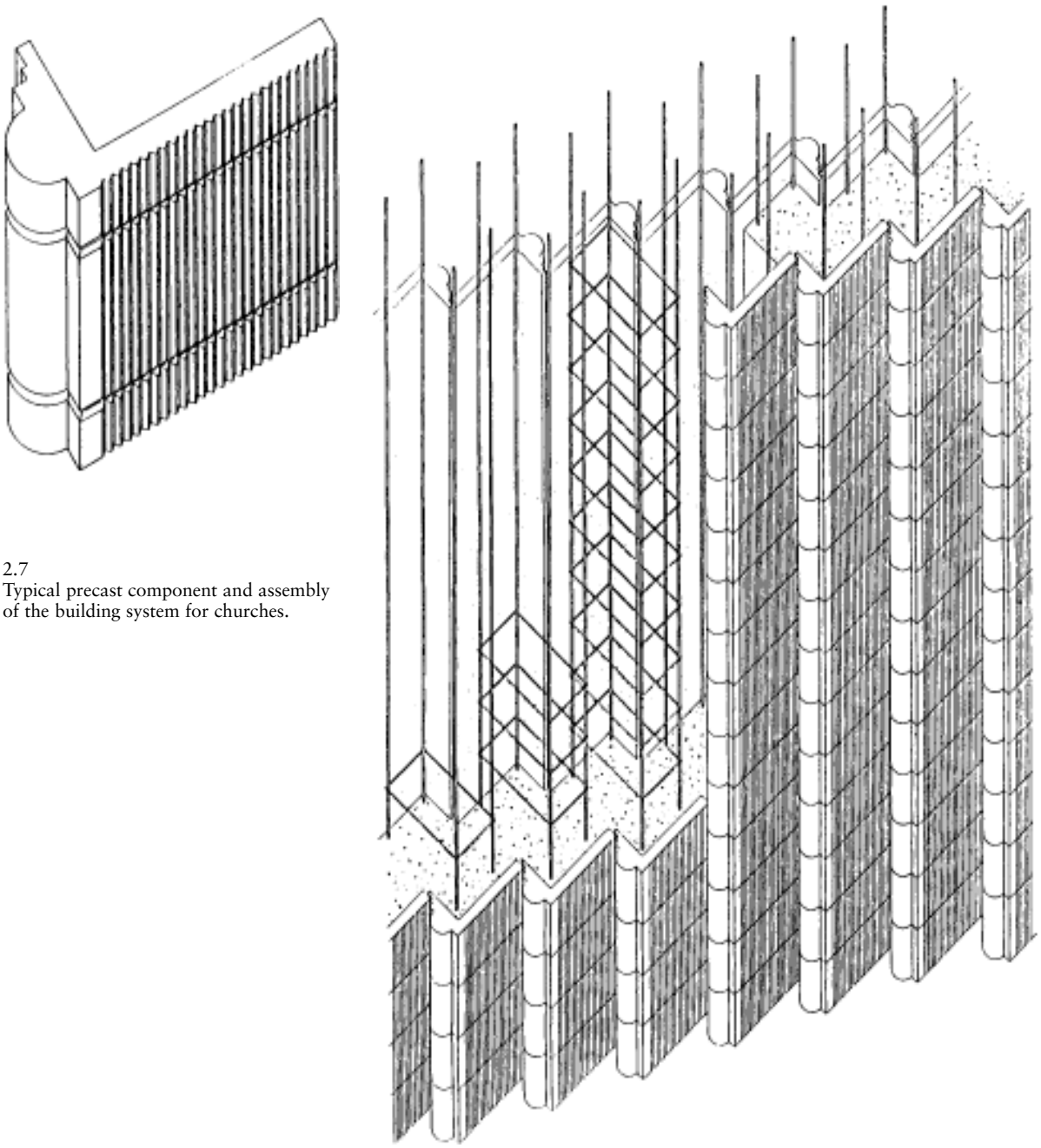
Finally, the managing director and Dioguardi personnel became quite involved in the development of Tecnopolis in Bari, a technological park aimed at the cultural, scientific and high-tech industrial advancement of southern Italy.

Figures 2.9 and 2.10 show the different organizational models that enhanced the evolution of the firm from the beginning to the end of the 1980s respectively.

The evolution of the firms is characterized by the following learning experience.

Growth capabilities

In the 1981–1990 period Dioguardi significantly increased the volume of sales with an average yearly increase of 12% (well

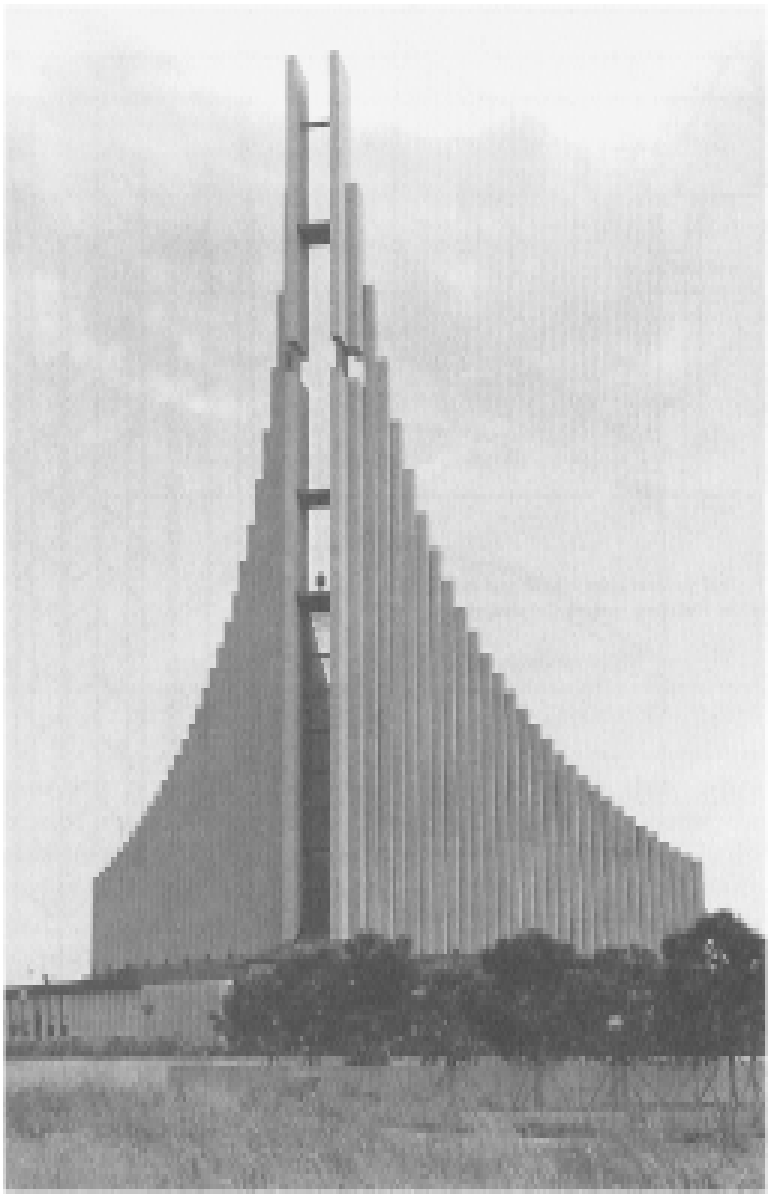


2.7
Typical precast component and assembly of the building system for churches.

above the Italian inflation rate). Market growth was achieved by using three main strategies.

- Consolidation and expansion of the market niche consisting of a pool of repetitive clients. Given the

2.8
The church of S.Maria Madre del Redentore in Rome.

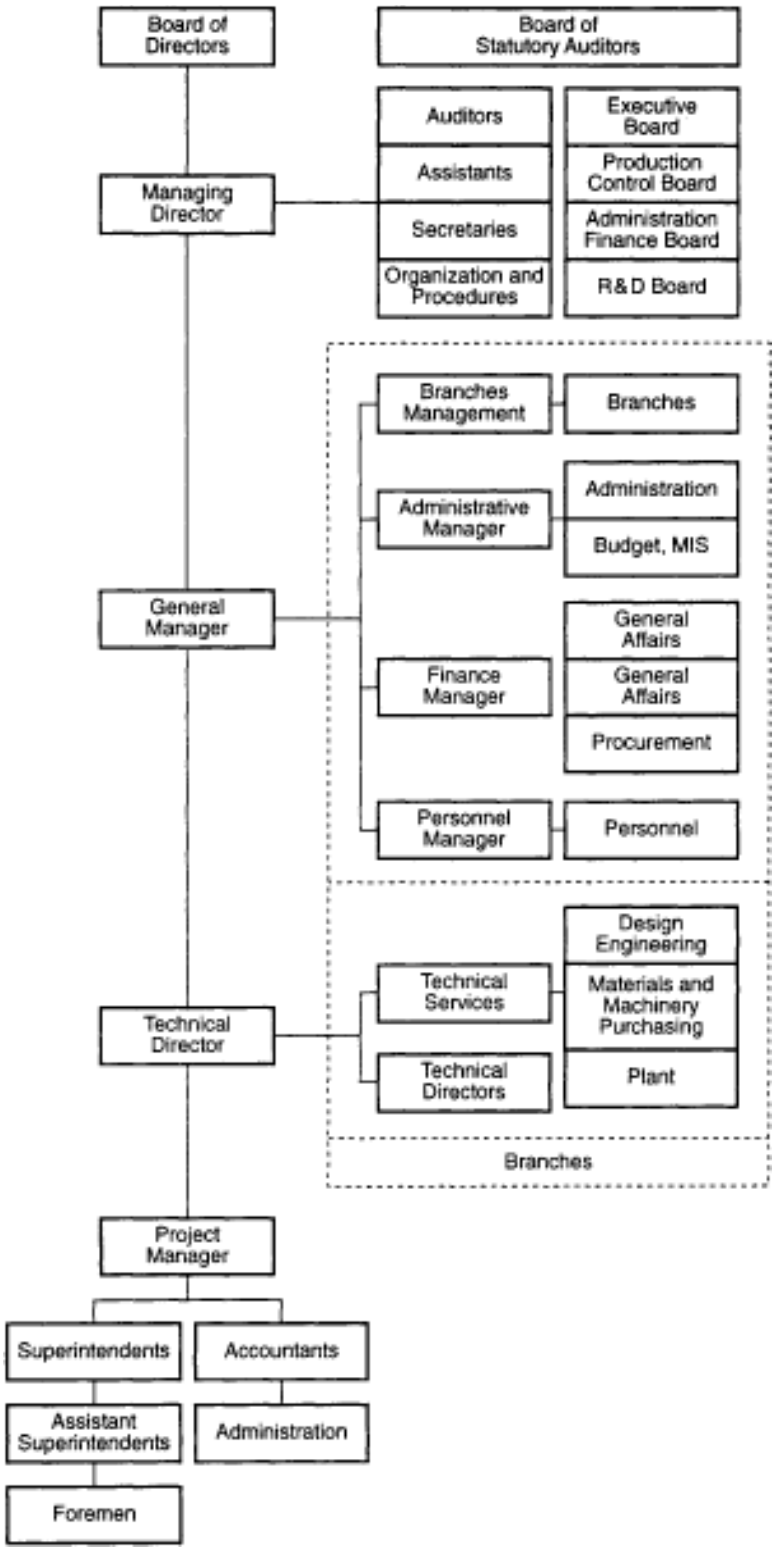


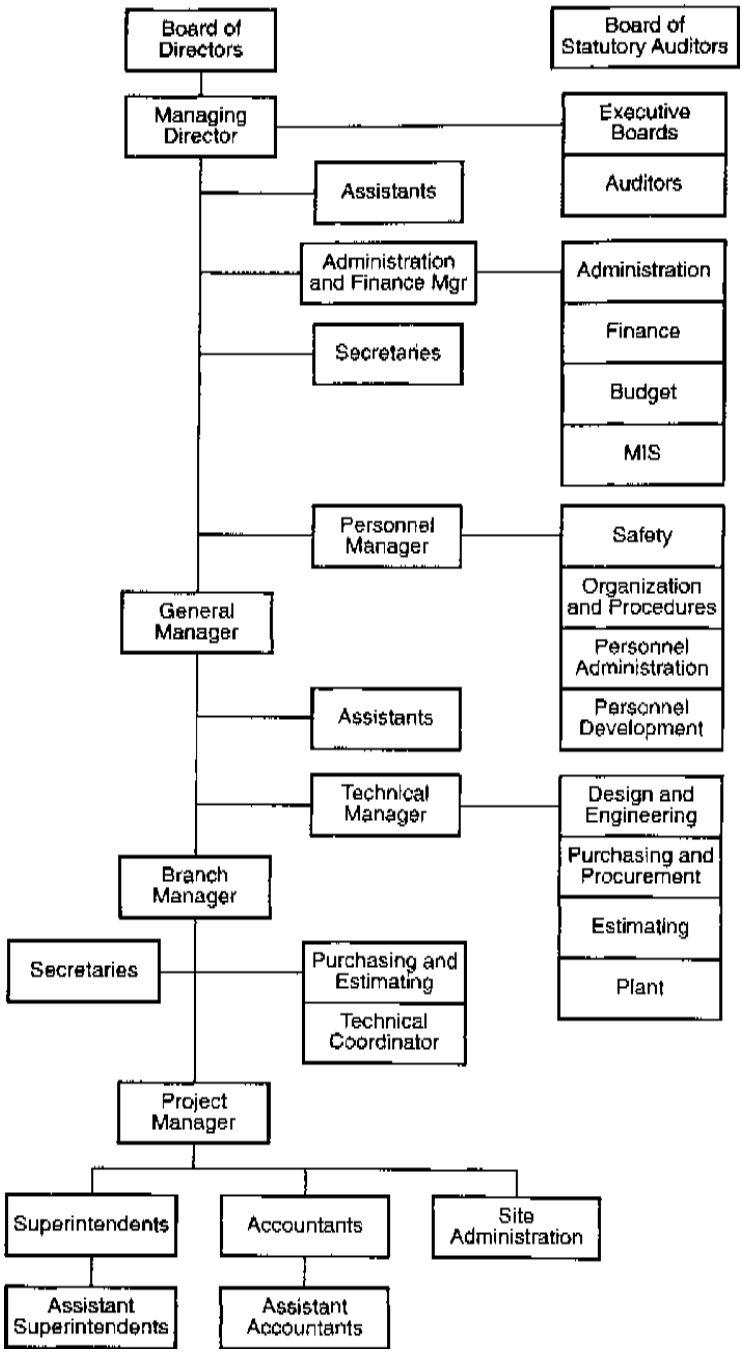
customized nature of the services and the long-term relationship with the clients, projects were undertaken on a negotiated contract basis.

- Participation in open-bid projects. Although less profitable, this line of jobs facilitated the penetration into new markets and the establishment of relationships with new clients.
- Self-promotion of industrial and office projects, which were often leased out to traditional clients (e.g. SIP).

2.9
Dioguardi's organizational model (late 1970s and early 1980s).

The board of directors governs the firm, whose strategies are implemented by the managing director. In performing his duties, the latter is assisted by: four committees (the board of executives, the most important one, and the production control, finance/administration and R&D committees, which are composed of Dioguardi's management personnel and outside consultants); and his own staff of secretaries and assistants, of which the organization and procedures office is the most important one. The general manager (chief operating executive) executes the selected strategies with the assistance of the technical director and the managers of the local branches and administration, general affairs/financing, and personnel offices. The technical director, in charge of all production operations, is supported by design/engineering, estimating and purchasing offices.
Organizationally speaking, the production of the branches is supervised by the technical director, while their administration is linked to the general manager's office. All project managers depend on the technical director's office and are responsible for the technical and economic performance of construction projects. The functioning of the organization is based on the principles of formalization, delegation and cooperation.





2.10
Dioguardi's organizational model at the end of the 1980s.

In the late 1980s, the managing director was assisted only by the board of executives. The production control committee was placed under the supervision of the general manager. The administration/finance and personnel departments were expanded and placed under the control of the managing director. Within the administration/finance department, the budgeting and MIS offices achieved particular status given their respective roles as the programming center of the firm and data processing and diffusion center. In this regard in the late 1980s, Dioguardi computerized all accounting, cost control and scheduling operations and furnished the expanded design office with CAD stations. The expanded personnel department, consisting of the safety programs, organization and procedures, personnel administration and human resources development offices, reflects the firm's systematic approach to developing and motivating its personnel.
Although differentiated in terms of responsibilities, the functions of general manager and technical director were assumed by the same person. He supervises four support functions: design and engineering, purchasing coordination, estimating and bid preparation offices, and material and machinery depot. These support functions are decentralized at the branch level but centrally coordinated, thus requiring a great mobility by their respective managers/coordinators.

These results were obtained through the marketing efforts of branch managers, the promotional initiatives for potential clients, such as feasibility or design studies aimed at solving their specific needs, the continuous improvement of the corporate

image, such as the sponsorship of cultural events and publications, and high-visibility projects with famous architects, such as the project for La Scala theater in Milan with Renzo Piano. High-profile projects, corporate image and organizational culture gave Dioguardi characteristics of uniqueness within the world of its competitors. The long-standing cooperation with 'star' architects is another differentiation tool used by Dioguardi. This approach is particularly important in project initiation. The combination of 'signature' design and reputation for quality work becomes one of the major selling points for the firm's services to potential clients.

Enhanced information-processing capabilities

The growth of an organization creates the critical problem of the efficient coordination of its operations, particularly when an increased number of personnel, geographically remote projects and decentralization increase task uncertainty and the need for information processing (Galbraith, 1973). In this regard, it is necessary to find a balance between the information-processing needs and capabilities of the organization. In the case of Dioguardi, formalized procedures and self-contained tasks (typical of its divisionalized structure) reduce the need for information processing, while the integrative nature of the scheduled meetings of the committees and the developed management information system increase the organizational capacity to process information. The same scheduled meetings help executives to share corporate goals and keep them abreast of the firm's evolution. The sharing of corporate values is also facilitated by frequent seminars, publications by the managing director, and his educational role with young executives. In this connection, all managers of Dioguardi's Italian branches are from the Bari area, and some are former engineering students of the managing director. Two of the branch managers are also university professors with the same specialization as Gianfranco Dioguardi.

Enhanced specialization capabilities through R&D

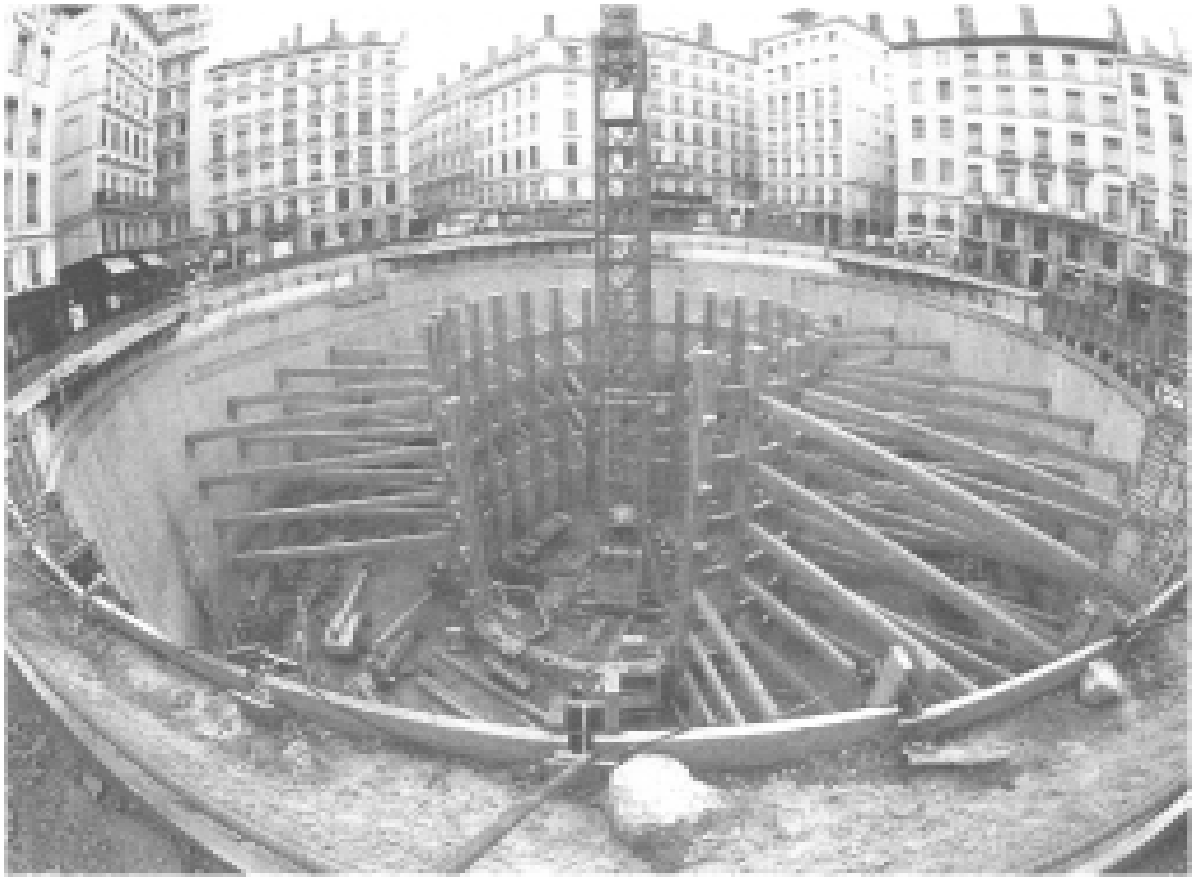
Systematic and formalized R&D activities are rarely undertaken in the construction industry, particularly by small and medium-sized firms. In Dioguardi's case, the research projects undertaken by EGECON, other subsidiaries and outside consultants increased its specialization. The studies of the school and telephone exchange building programs together with the Neighborhood Laboratory aimed at developing

process specialization, i.e. management capabilities for construction or renovation programs. The building systems (e.g. Binistar and Arclatum) aim at product specialization. R&D activities are also a good marketing tool that enhances Dioguardi's image of an innovative construction firm and differentiates the firm from its competitors.

Phase 4: Becoming a European-oriented firm, 1990 to date

At the beginning of the 1990s Dioguardi expanded into the European market with the establishment of a French (Lyon), a Spanish (Madrid) and a German (Berlin) subsidiary, and by undertaking promotional projects in Seville, Moscow and Prague. The geographic diversification reflected the vision of developing a truly European company, with know-how and experience not limited to the Italian market. The diversification, in addition, was a timely move for the well-being of the firm, given the upcoming sharp recession of the Italian market. The expansion followed the strategy of exporting Dioguardi's established capabilities in terms of organizational strength, design engineering, quality construction and sponsorship of social and cultural projects. Rather than pursuing growth by acquisition, Dioguardi favors the progressive development of the local branches and their assimilation into the surrounding social and business communities, an approach that started in 1975 with the opening of ICIM SUD in Brindisi. Dioguardi does not seek just any kind of construction work, but targets quality projects that differentiate the firm from competitors and enhance its capabilities, such as the use of its building systems (Binistar, Arclatum and the new system for churches), the engineering/construction skill developed with underground garage projects or the proposal of the Neighborhood Laboratory. Financial risks are lessened by the formation of consortia and equity partnerships with Italian and foreign contractors as well as local investors.

In the same years, Dioguardi consolidated its national expansion by opening a branch in Florence. In the 1990–1992 period the volume of sales increased by a yearly average rate of 30%. The growing importance of maintenance work was recognized with the creation of a separate division. The new division reflects Dioguardi's strategic answer to the changing nature of the construction market. An increasing number of clients who own large building port-folios seek broader management services in addition to the traditional construction capabilities. To this end, Phoenix, a software system aimed at supporting maintenance programs for large building port



2.11
Underground garage under construction in Lyon.

folios, was developed in-house. In this context, Dioguardi presents itself as a service-oriented company, which assists clients in the solution of the problems arising in all phases of the building cycle.

Figure 2.11 shows the ongoing construction of an in-house-designed underground garage for 460 cars in Lyon (France). In this project, Dioguardi experimented with the concept of *chantier événement,* as a meeting place between the company and the local community. A large wooden model, newsletters, meetings with school children and training courses for young unemployed people were the main features of this initiative.

A large part of Dioguardi's sales is still directed to repetitive clients, for whom the firm undertakes telephone exchange facilities, post offices and airport projects (design, construction and maintenance services), and develops office buildings to be leased out to them. In addition to this traditional type of work,

Table 2.4 Major projects, by type and geographic location, executed 1990–1993

Airport facilities (Rome, Milan and Moscow)
Underground garages (Naples and Lyon)
Office buildings (Bari and Foggia, for own account)
Research facilities (Florence, Rome and Lyon)
Power plant (Brindisi, completion)
Post offices (Milan, Bari and Lecce)
Various projects: bank, telephone exchange center, fire brigade headquarters (for own account) and industrial warehouse (for own account)
Binistar projects (Milan, Rome, Bari and Spain)
Miscellaneous maintenance and renovation projects

Dioguardi is engaged in two new types of projects: research-oriented facilities (France, Rome and Florence) and underground garages (Milan, Naples and Lyon). This last type of project reflects the synergies achieved by the design and construction departments in developing an innovative construction technique that is based on micropiles (retention walls and foundations) and jet grouting (subsoil consolidation), and is to be used in congested urban areas.

Table 2.4 lists the major projects, by type and geographic location, that were executed in the 1990–1993 period. Figure 2.12 shows the ongoing refurbishment and expansion of the post office headquarters in Milan. The expansion was undertaken while keeping the historical facade of the building unchanged. The extra space (60% of the existing area) was obtained by building a deep basement below the level of the existing foundations. Figure 2.13 shows an 11-story building that hosts the business training school of a major telephone company in Bari.

Dioguardi's design capabilities were further expanded by adding new personnel and installing CAD stations. The design/ engineering division performs throughout the project life cycle, from the development of the technical proposal that optimizes the firm's construction capabilities at the bidding/ negotiation phase to the engineering of the construction process during project execution. The design division has become a vital link between the strategic objectives of a proposal and the efficiency requirements of production.

The research activities are aimed at improving organizational efficiency and expanding the breadth of know-how through extensive use of information technologies. A technological research lab has been created, a kind of clearinghouse to be used for solving specific problems at construction sites and diffusing their solution to other sites. In this regard, the firm has experimented with the use of video-conferencing (e.g. participation in the European Community-funded Bricc

2.12
Post office headquarters under refurbishment in Milan.

2.13
SIP building in Bari.

project), e-mail and on-line file and data processing retrieval systems. A software program, Ipercantiere, was developed. This multimedia system for construction sites is designed to manage all the complex documentation of construction jobs. The system complements the CAD stations in the design/engineering division.

The know-how in the management of renovation/maintenance programs was expanded by undertaking two research projects in the area of programmed maintenance and by repeating the experimental experience of the Neighborhood Laboratory in other Italian cities, such as Otranto, Rome and Cosenza. Dioguardi's growing experience in the renovation field has been applied to the restoration of the historical center of Bari. The execution of the project was accompanied by the development of Iperbari, a multimedia software system that describes the true fabric of the old part of the city through the use of texts, architectural surveys, data bases, maps and photographs.

The repetitive experience with the Neighborhood Laboratory, together with the sponsorship of cultural events and donations to local communities, has fulfilled the philosophical mission of a socially concerned and participative firm. The social role was reinforced by the creation of Meridiana, a cultural division that sponsors seminars and events aimed at diffusing general knowledge.

The research activities aimed at improving the firm's organizational effectiveness have been complemented by a series of initiatives aimed at developing in-house personnel, such as training courses for its specialized construction workers, the further development of safety programs and seminars for middle-level managers on topics such as organizational matters, new building-related laws and industrial relations.

The early 1990s witnessed significant changes in the traditional markets of Dioguardi, which entailed new strategic orientation and organizational settings. In 1992 a sharp downturn in the Italian economy coincided with major scandals over public sector awards. The indictment of politicians, civil servants and entrepreneurs virtually halted the award of public projects and paralyzed the building regulatory process, with damaging effects on the private sector. In the following years the crisis had devastating effects on construction firms, with many bankruptcies. In the case of Dioguardi, the significant contraction of domestic sales was counter-balanced by strong foreign sales, particularly in Germany, with the acquisition of several projects in Munich and Berlin.

The growing importance of the German market (approximately 50% of the company's sales in 1995), however, presents unique challenges in regard to different construction standards and procedures, stricter interpretation of contractual obligations, and the search for bilingual personnel who are qualified to operate in the local market. This last challenge is complicated by the availability of underutilized personnel from Italian branches. As far as the Italian market is concerned, Dioguardi is aware that increasing community scrutiny, lack of public funds and newly developed public procurement laws will affect the nature of the demand, in terms of financial and organizational procedures and quality, cost and time requirements of public projects, with significant impact on the modus operandi of the industry and the strategic orientation of firms. These matters are changing the old business paradigm of construction companies, which was based on high profit margins, because of insufficient contractual documentation, laxity in contract administration and lack of control of public expenditures. Scandals and lack of public funds are bringing the Italian market in line with that of other European countries, where thinner profits and fiercer competition impose production efficiency and quality services for success. The composition of the Italian construction industry, in addition, has been changing, with the formation of large construction groups whose financial capabilities and wide scope of services put at a disadvantage medium-sized firms such as Dioguardi. The company, consequently, has readjusted its organizational structure and operations. Reporting directly to the managing director, three newly created marketing, real estate and R&D management offices pursue new and specialized market niches, and entrepreneurial initiatives that are based on innovative and quality services. Two other management offices have been created for improving operational efficiency. The first one controls all the design and construction functions and quality compliance programs; while the second one focuses on purchasing, bid and proposal development and safety programs. Dioguardi is also aware that the addition of new capabilities, e.g. financial resources and expanded scope of services, can be achieved by forging alliances both domestically and internationally.

In this regard, the company can take advantage of the cooperation with Beacon for improving its construction management and financial engineering capabilities, and expanding its market in the USA.

3 The historical evolution of Beacon Construction

The history of Beacon Construction Company (Beacon) is characterized by four overlapping but different strategic orientations, which reflect the firm's answer to changing external conditions: the state of the national and local economies, federal, state and local intervention in building programs, and attitudes toward real estate investments, all of which result from the evolutionary learning process of the firm.

From its inception in 1946 until 1965, Beacon drew a large part of its income from successfully bidding for public projects, mainly housing, military installations and postal facilities. In this phase, Beacon acted as a general contractor, taking advantage of the federally sponsored programs enacted after World War II. During this period Beacon developed construction skills and the necessary know-how for entering the business of real estate development. Its projects still tend to be small and repetitive.

From 1965 to 1988, Beacon was involved mainly with negotiated projects by building on its own account: housing, office and hotel projects. This period was characterized by two phases, 1965–1978 and 1978–1988, differentiated by the different scale of projects and the pace with which they were undertaken. In the first phase, Beacon evolved as the construction arm of a real estate company whose expertise covered all phases of the building life cycle from planning to operation and maintenance. In this instance, Beacon's line of business became strictly intertwined with that of its sister real estate company. With its organizational growth, Beacon took advantage of the synergies of an integrated company by developing expertise in the management of the full building delivery process. In the second phase, 1978–1988, the skill and technological capabilities were augmented by undertaking a series of unique, complex and large urban projects.

In the last phase, from 1988 to date, Beacon largely stopped building for its sister company because of the economic recession, particularly in the commercial construction sector. The firm once again began seeking work from outside clients. Building upon its experience with its real estate sister company,

the firm evolved as a service-oriented company offering management and consulting services, in addition to traditional construction services, to educational and health care institutions and to users of commercial facilities. New construction, renovation and rehabilitation projects have been medium sized and technically complex.

Phase 1: Building for outside clients, 1945–1965

The Beacon Construction Company was founded in 1945 in Boston by Norman and Robert Leventhal, two young civil engineers from MIT, immediately after World War II. During the late 1940s the firm was involved in small projects such as store remodeling. Opportunities for growth were limited, given the stagnant local private market. The brothers soon turned their attention to the federal construction programs, which aimed at developing the country's infrastructure, spurring the economy and counteracting the Russian military threat. Highway-related facilities (e.g. tollbooths and restaurants) and military installations (missile silos, military barracks and radar installations) and related services were the major projects successfully bid for in the early 1950s.

Beacon was also involved in public and private housing. The latter was spurred by federal government mortgage insurance programs. The housing business grew significantly. In order to successfully cope with the significant number and scale of projects, the firm started the policy of continuously improving the efficiency of its production operations. This attitude was nurtured by the owners' previous engineering training at MIT and the fiercely competitive nature of the housing construction market. The improvement efforts led to the transformation of traditional construction sites into a kind of assembly line, with systematization of framing operations and extensive use of prefabricated components. The superior production organization that resulted yielded very competitive prices. By building several thousand units Beacon mastered the housing construction process. A wide geographic distribution is the common characteristic of many of Beacon's projects. In the late 1950s (1957–1959), Beacon transformed itself from a regional contractor to a nationally oriented company. By operating in 15 states and Puerto Rico, and with regional offices in Chicago and Charlotte (North Carolina), Beacon became one of the top 50 general contractors in the USA.

This remarkable growth resulted from several factors:

- The dedication of project managers and superintendents, whose motivation derived from the owners' trust in their

Table 3.1 Major projects, by type and geographic location, executed 1945–1965

Private housing (Massachusetts, Connecticut, North Carolina, South Carolina, Tennessee, Virginia, Maine, New York State, Kansas, Illinois)
Highway services (toll plazas and related services, gas stations, restaurants; New York State and Ohio)
Public housing (military included; Massachusetts, Maine, Puerto Rico, New Hampshire)
Military installations (missile silos and radar facilities; Connecticut, Nebraska, Iowa)
Hospitals (Michigan) and research facilities (Massachusetts)
Industrial buildings (Massachusetts, New York State)
Hotels into apartment buildings (Massachusetts)
Post offices (Michigan, South Carolina, Pennsylvania)
Water treatment plant (Massachusetts)

individual talents and needs, and reward for their loyalty and skill.

- Extensive subcontract management capabilities and coordination skill. In this regard some outside projects, e.g. post offices, were subcontracted completely.
- The careful targeting of those federal programs that could provide a long-term stream of revenues. Given the competitive nature of these projects (the award was based on the lowest lump-sum price), Beacon tried to avoid harsh competitive bidding based only on price by:

  - participating early on in federal programs and leaving them before 'the masses came in';
  - selecting projects that required additional expertise, e.g. design services that Beacon's small design/engineering office could provide, or capabilities in the purchasing and coordination of subcontracting services. In this last regard, the firm focused more on the development of managerial reputation than of engineering expertise;
  - being a responsive low bidder rather than the lowest bidder, by focusing on the successful performance of a project rather than seeking postcontractual advantages at any cost.

In the early 1960s Beacon targeted federal programs for the construction of military housing and postal facilities. By requiring up-front financing, these projects represented the firm's first leap from construction to real estate development services. Table 3.1 lists the major projects, by type and geographic location, that were executed in the 1945–1965 period. Figure 3.1 shows a typical residential project of the period.

The execution of projects, and the evolution of the firm, underline the following learning experience:

3.1
Residential project.

Development of logistics expertise

In 1954 the successful construction of toll plazas (40), gas stations and restaurants along the New York State Thru-way required a careful planning of concrete operations at different locations spread over 430 miles (690km). This skill was applied to later projects such as the service plazas on the Ohio Turnpike and military installations in remote areas.

Development of construction planning expertise

In the 1950–1965 period, Beacon constructed several thousand housing units, sometimes in remote rural areas such as military sites. Given the labor-intensive nature of the projects, shorter construction duration was important for ensuring appreciable profits. A typical example of construction planning skill is the 1200-unit project at Ft Devens (MA), completed 18 months earlier than the contractual deadline. In-house pre-cut lumber and timely delivery of materials were crucial for shortening the duration

of forming and framing operations. Approximately 1 mile (1.6km) of foundations was poured every week.

Development of purchasing and construction management capabilities

At the peak of its geographic expansion Beacon operated in 15 states and Puerto Rico. This achievement reflected the development of estimating, purchasing and coordination skills. Estimating capabilities, particularly the scheduling of quantities and production rates, had been nurtured by work done with its own forces, e.g. housing projects. This knowledge was a major asset in negotiating the subcontracting of parts of the work or of the total work to other contractors, as in the case of the post office projects. Estimating skill was also complemented by experience in the purchasing of materials and building systems. This ability sometimes resulted in labor subcontracting-only arrangements. Managing multiple construction sites thousands of miles away from Boston would not have been possible without coordination capabilities and a pool of motivated and mobile superintendents and project managers.

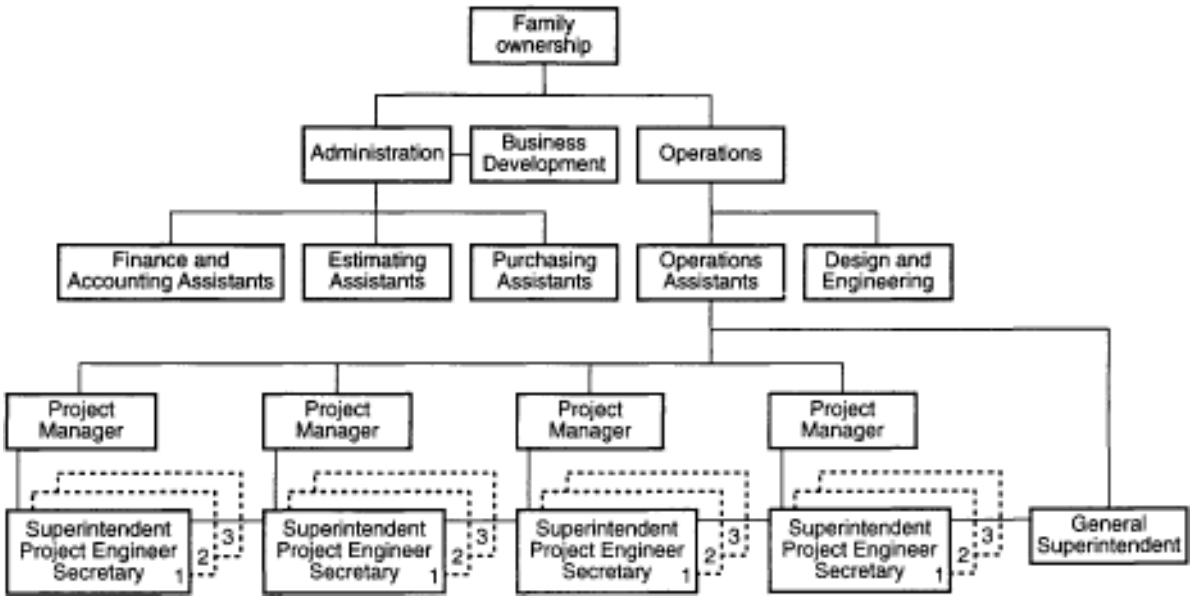
Acquiring knowledge for developing future real estate operations

In the projects (e.g. military housing and post offices) for federal programs, Beacon was required to provide up-front financing and temporary ownership, and after completion to lease back or sell the properties to the federal government. Because these turnkey projects were awarded on the basis of the lowest rent or selling price, the mastering of financial aspects was an important competitive factor in winning the contracts.

In the 1950s, Beacon had a simple organizational structure composed of approximately 30 people, organized around the two founding owners. Figure 3.2 shows the main conceptual organizational components of the firm and briefly discusses its operational features.

Phase 2: Building for its own account, 1965–1978

Beacon's entrance into the real estate development and management business at the beginning of the 1960s was a turning point in the firm's history. It represented the first transitional step from a construction company, working for third parties, into an integrated real estate firm with a



3.2
Beacon's conceptual organizational chart in the 1950s.

In the 1950s Beacon's organizational structure was organized around the two founding owners. Robert Leventhal and his assistants oversaw purchasing, finance/ accounting and estimating activities. Robert was also in charge of business development and external contacts. His brother Norman managed all construction operations and the design/engineering office.
Notwithstanding the wide geographic latitude of projects, accounting and purchasing functions were centralized. This arrangement would remain one of the major organizational features of the firm over the years.
A small core of four young project managers (out of four, three were recent MIT graduates) oversaw up to five projects at the same time, with frequent visits to construction sites. Site organization generally consisted of a superintendent, project engineer and a secretary. Projects far from the home office were generally almost completely subcontracted. In special circumstances dictated by schedule or technical constraints, however, and in local projects, Beacon directly undertook concrete and framing operations.

foundation in construction. Initially, risk diversification and creation of construction work were the rationale behind the shift toward real estate initiatives. Years later the further interest toward this line of business would be induced by other factors: the phasing out of federal programs (e.g. military housing), the economic revival of the Boston area, and the development of the local urban renewal programs. In response to these changes, in 1959 Beacon pioneered the development of its first suburban office building in Wellesley, which became the basis of a large office park owned by the firm. The site had been selected for its proximity to a main highway, a growing area of high-tech industrial facilities and favorable zoning conditions. The park became Beacon's laboratory for new office projects. The feedback from operations helped the firm in devising energy-efficient mechanical systems and acoustically reliable interior partitions. The attention toward energy-saving active systems would become a trademark of Beacon's buildings. Figure 3.3 shows one of the buildings of the office park.

At the same time Boston officials sponsored a revitalization plan of 65 acres (26ha) located in the center of the city. In 1961 the Boston Redevelopment Authority issued a request for proposals for the design and construction of a central site facing City Hall Plaza. Aided by a skilled design advisory council, Beacon and its architects produced a winning proposal for a 900ft-long (270m), three-part, curvilinear building with

3.3
One of the Wellesley Office Park buildings.
(Photo by Steve Rosenthal)

office and retail use called Center Plaza, shown in Figure 3.4. It is important to underline the advisory role of the faculty of the MIT architecture school during this experience, particularly that of Pietro Belluschi, who was then dean. His consulting role would be progressively strengthened over the years, and expand into a close relationship with the MIT faculty and the MIT community at large.

The expertise gained in the Center Plaza project was applied later on in two renewal projects in Worcester (MA) and Syracuse (NY). Center Plaza and Wellesley Park (three more office buildings) were the main development activities in the 1960s. In the same period, the firm was also engaged in the construction of post offices, military and private housing and in rehabilitation projects.

Organizationally speaking, Beacon's growing real estate initiatives and portfolio of properties entailed the development of new functions: finance, development and building management. The first two were created by hiring new people, while the latter was formed by transferring construction

3.4
Center Plaza project in Boston.
(Photo by Steve Rosenthal)

personnel. Construction activities were overseen by the offices of three project managers, promoted to vice-presidents of operations. Two of them were in charge of local projects, while the third, based in the Chicago branch, managed all outside projects, particularly housing and post office sites in the Midwest. Each office acted as a profit center, whose operations relied significantly on the individual capabilities and entrepreneurial skill of each vice-president.

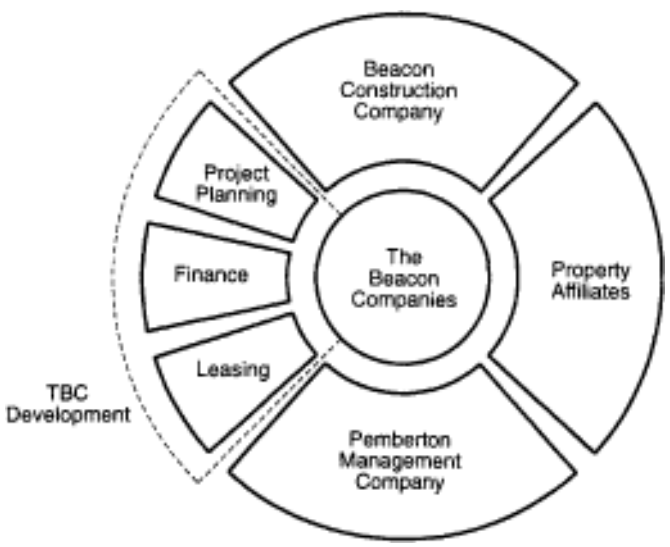
In the early 1970s, two economic recessions triggered a sharp downturn in the construction market. The decade was characterized by a rapid increase in construction costs and interest rates, record levels of disposable personal income, and increasing regulations (MacAuley, 1981). Government-sponsored urban renewal programs faced the criticism of opposition groups protesting against the eradication of entire old neighborhoods and the construction of new 'modern' central urban areas. In response to the critiques of its comprehensive programs of the 1960s, the federal government created a new program to make low-income housing developments more attractive, with the idea of filling 'spots' in the urban tissues. Beacon took advantage of this program.

By the middle of the 1970s, the firm had developed and constructed a steady flow of medium-sized repetitive housing projects in New England, some of which (apartment buildings) made extensive use of prefabricated concrete components. These projects became a primary source of income and funding for other real estate operations.

In the same years, Beacon was also engaged in the construction of post offices, industrial facilities and warehouses, research buildings and rehabilitation projects (conversion of hotels into apartment buildings).

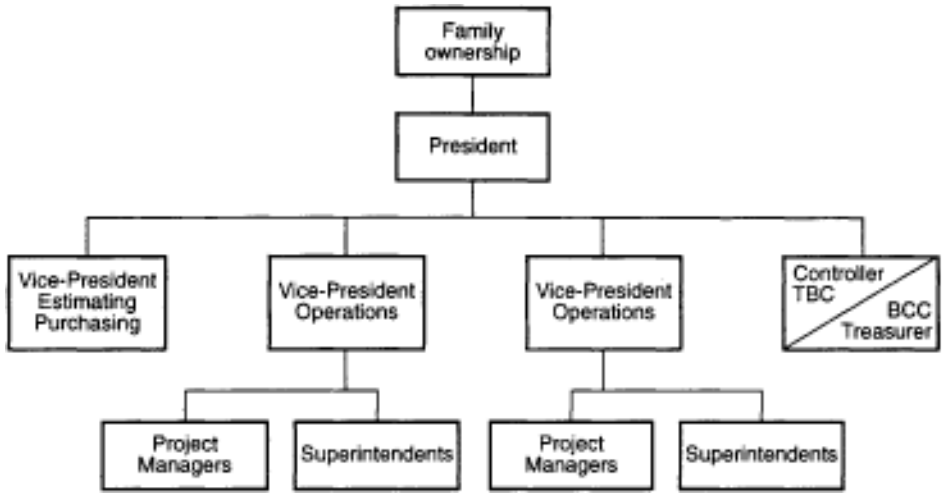
Starting in 1972 Beacon underwent a major organizational change with the death of Robert Leventhal. Norman Leventhal, the surviving owner, shifted his attention from construction operations to the new business and finance activities that had previously been undertaken by his brother. A Beacon vice-president took over construction operations. A new entity, The Beacon Companies (TBC), with a focus on property development and management, was formed. The move resulted from a shift of the corporate attitude toward real estate, by recognizing that this line of business was no longer solely a source of risk diversification, but rather a viable investment with returns far higher than those experienced in the contracting business. The new company eventually had several divisions, each in charge of the different phases of the real estate cycle. A conceptual organizational chart of the new company is shown in Figure 3.5.

Within this new integrated company, Beacon acted as the construction division, whose primary task was to service TBC



3.5
The organization of The Beacon Companies in the late 1970s.

In the middle 1970s TBC consisted of four organizational groups, which covered all phases of the real estate process: development, construction, ownership and property management.
TBC Development initiates projects, coordinates leasing and provides central accounting and financial services for the other three parts of TBC.
Pemberton Management Company coordinates the management of Beacon properties by providing support and consulting services to two separate management divisions in charge of residential and commercial properties.
Property affiliates consist of entities often assembled to broaden the equity-participation in a project and a subsidiary that performs tenant improvement work in office buildings after initial occupancy.
Beacon Construction Company transforms what is planned by TBC into a completed structure.



3.6
Beacon's conceptual organizational chart in the 1970s.

in the development, design and construction of its buildings, as is reflected in Beacon's organizational chart shown in Figure 3.6. The company structure is heavily skewed toward operations under a president who, in practice, functions as a chief operating officer by being involved in the negotiation and purchasing of subcontracting services. Project operations rely heavily on the implementation capabilities of superintendents, with less emphasis on the administrative aspects of a contract. The strong implementation orientation is reflected in the role of project managers, whose function is limited to expediting papers and subcontractors. Lack of marketing or planning functions underlines Beacon's dependence on TBC's work. In the chart TBC's finance/accounting office services Beacon's operations: in practice, a form of control by the sister company. This organizational arrangement marked the orientation of the construction business to TBC's real estate investments.

Table 3.2 lists the major projects, by type and geographic location, that were executed in the 1965–1978 period.

The execution of projects and the evolution of the firm underline the following learning experience.

Quality building philosophy

Being part of a company that promoted, owned and managed properties, Beacon took advantage of the feedback of these functions by developing an integrated view of the buildings it constructed. Beacon was interested in improving the overall value and long-term revenues of the properties owned by TBC.

Table 3.2 Major projects, by type and geographic location, executed 1965–1978

Subsidized and private housing (Pennsylvania, Virginia, Massachusetts, New York State)
Post offices (Oklahoma, Ohio, Puerto Rico, New York State, Maryland)
Suburban small-scale office complex (Massachusetts, six units)
Urban renewal projects (Boston, Worcester, Massachusetts and Syracuse, New York State)
Rehabilitation projects (Massachusetts and Michigan)
Industrial buildings and warehouses (Massachusetts)
Research facilities (Massachusetts and Michigan)
University dormitories (Boston)

This attitude toward a client was to become a major tool for differentiation from competitors when Beacon started seeking jobs from outside clients in the late 1980s. Quality construction and finishes, space flexibility and low-energy-consuming mechanical and electrical systems were the main characteristics of the office buildings constructed by the firm.

Social cooperation approach

By constructing projects in critical urban areas such as that of Center Plaza, Beacon became an integral part of the social, political and economic forces that shaped the fabric of the city of Boston. By building consensus with city officials and planners and establishing long-term cooperative links with the architectural profession, Beacon mastered the intricacies of the building regulatory process and achieved a reputation as a socially and architecturally concerned firm. This reputation was also enhanced by the stable relationship that Beacon had with the local architectural and engineering schools by favoring the hiring of their students, sponsoring research and endowing chairs.

Phase 3: Evolving as a service-oriented construction company, 1978–1988

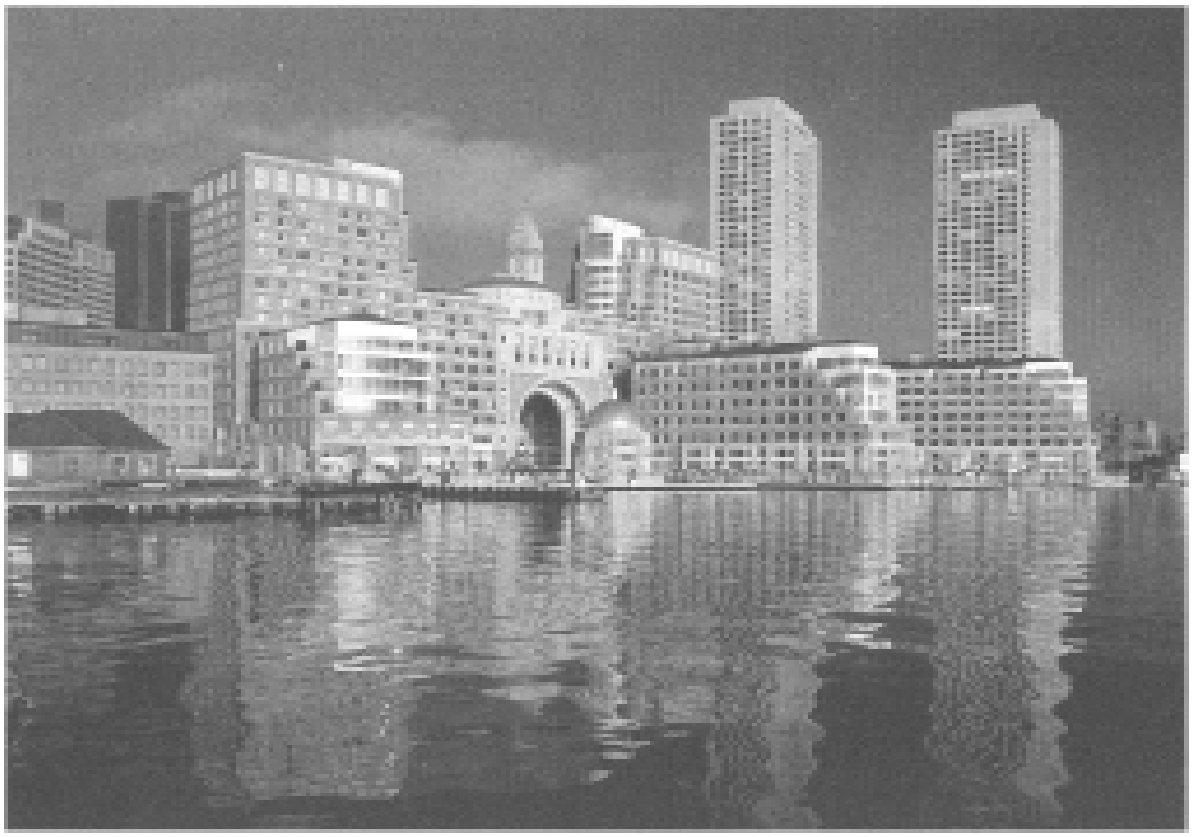
In the second half of the 1970s, the federal government withdrew its subsidy for low-income housing developments. At the same time, economic activity in Boston increased and the local real estate market improved, particularly the demand for large-scale office projects. Pension funds and life insurance companies, traditional investors in real estate, regained confidence in the market. This situation spurred the further expansion of the Wellesley Office Park and a series of large office buildings (Fiduciary Trust, 1978; One Post Office Square, 1982; 75 State Street, 1989) and multi-use projects (Rowes

Wharf, 1987) in downtown Boston. Uniqueness, high-quality features and delivery complexity were the main characteristics of these urban projects. These new TBC initiatives required a shift in Beacon's operational culture and focus. Its strong implementation orientation was geared toward projects, such as housing, with straightforward and stable design and construction processes, but organizationally and managerially speaking it did not match the requirements stemming from the delivery complexity and different 'scale' of the new projects. The latter were characterized by a much more open-ended process, which required negotiation with different parties, continuous change management, and flexible and customized organizational approaches. The fulfillment of these needs entailed a new overall management that could lead Beacon to develop a process-oriented culture, and capabilities such as dialogue, delivery process management and innovative organizational approaches.

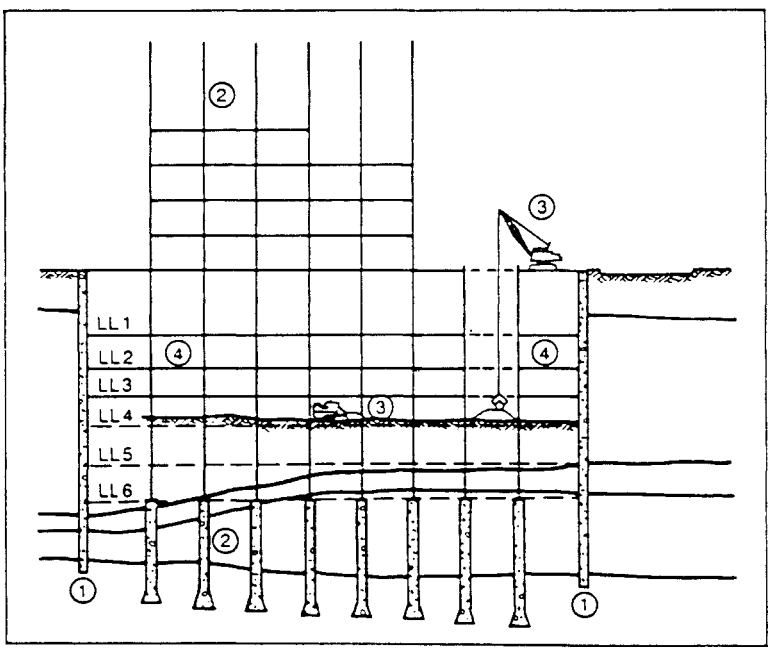
These capabilities were found in a former MIT civil engineering professor, James Becker, who, as a TBC executive, was involved in the management of the hallmark project of the real estate firm, Rowes Wharf. The $200 million luxury seafront project, shown in Figure 3.7, was designed by Skidmore Owings and Merrill, an internationally known architectural-engineering firm, which operates worldwide. The design incorporated and integrated several uses with different technological requirements: hotel, office, residential, retail, a deep underground garage and marina.

This executive was instrumental in the adoption of the combination of the up-down method and slurry walls in the construction of the substructure of the project, as shown in Figure 3.8. Originated in Europe, the up-down technique was almost unknown in the USA at that time. The technique allows the simultaneous construction of the substructure and superstructure, and leads to a shorter project duration with overall benefits in terms of lower financial charges and early income from building operations. Beacon acted as a general contractor in the project, which won praise from the architectural, construction and local communities. In this regard, the firm was particularly active in hiring from the minority workforce and subcontractors. The initiative, which later was extended to training programs to increase minority participation in construction trades and work, in the long run reflected Beacon's corporate policy of social cooperation.

In developing the site of One Post Office Square, as part of the deal with the previous owner, TBC acquired the ownership of an historical building, formerly the regional branch of the



3.7
Rowes Wharf complex.
(Photo by Steve Rosenthal)

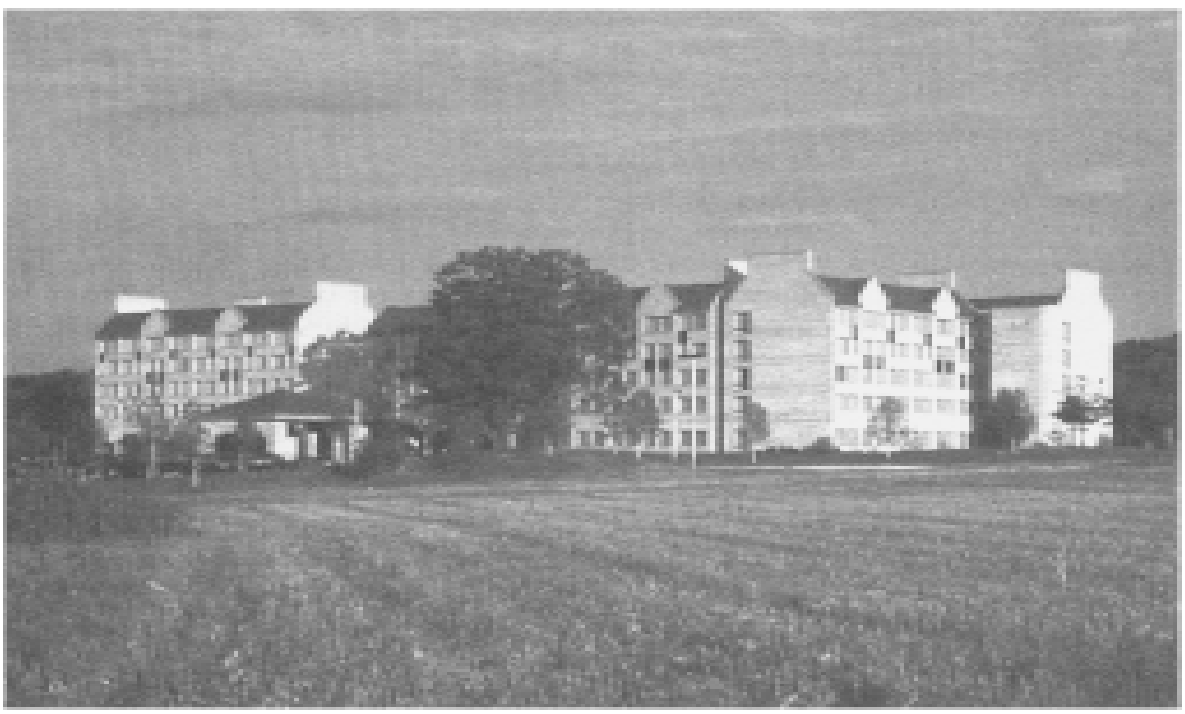


3.8
The major subsystems of the up-down technique in the Rowes Wharf project: 1, wall system; 2, column foundation system; 3, excavation system; 4, floor system.

Federal Reserve Bank. After several studies on the possible reuse of the building, TBC became aware of the increasing demand for hotel space in Boston, a city with an old and limited hospitality infrastructure. The successful transformation of the bank into a luxury Meridien hotel eventually marked TBC's entrance into the hotel development business. In considering new hotel projects TBC came in contact with a major national hotel company, and soon recognized the size of the American market. At this time, TBC quickly entered the hotel market on a large scale and started a development and operation program of business-oriented hotels. For this purpose, a separate hotel division was created in 1982. This new initiative also reflected the partial deregulation of financial institutions and advantageous tax regulations that spurred the real estate market in the early 1980s. The hotel program was characterized by several arrangements used in the previous housing projects: the development of prototype design and construction techniques and procedures to be further refined through repetitive projects.

Eventually Beacon was involved in the construction of a 12-hotel local and national program, which was completed in a six-year span. One of these hotels is shown in Figure 3.9.

3.9
Hotel project in Pennsylvania.
(Photo by Lawrence Williams)



In these years, the resources of Beacon were overstretched, considering the simultaneous development of office buildings and Rowes Wharf. Within TBC's projects, Beacon played a dual role. In the project planning and design phase it assisted TBC's development division in the feasibility and planning studies, provided cost and schedule guidelines, managed the design process and offered preconstruction services. During the construction phase, it acted either as a general contractor in local projects, sometimes in association with other contractors (e.g. Rowes Wharf), or as the owner's construction manager. This was the case in particular projects, such as 75 State Street, a high-rise office building, and all the hotels outside the Greater Boston area.

In the 1978–1988 period Beacon was also involved in large interior construction projects, such as tenant work on TBC buildings. In addition, in the field of rehabilitation and renovation projects, Beacon developed management capabilities for asbestos removal programs and techniques for working in occupied spaces. Some of the renovation projects resulted from the aging conditions of some TBC buildings constructed 20 years earlier.

Table 3.3 lists the major projects, by type and geographic location, that were executed in the 1978–1988 period.

The execution of these projects underlines the following learning experience.

Building delivery process management capabilities

With its early participation in the planning process of TBC, Beacon has developed the capability to 'control' the downstream phases of a project process through a careful selection of alternative delivery systems and subcontracting criteria. The benefits of such a proactive approach were augmented by managing the design process as the owner's representative. This approach led to a design that reflects not only the owner's concerns but also the requirements of the downstream phases of the building process: constructability and maintainability.

Table 3.3 Major projects, by type and geographic location, executed 1978–1988

Residential projects (Massachusetts, Pennsylvania, Virginia)
Suburban small-scale office project (Massachusetts, one building)
Downtown office projects (Boston, three buildings)
Hotel projects (nine units, Massachusetts, Connecticut, Pennsylvania, Michigan, Maryland, California, Illinois)
Complex mixed use projects (Boston)
Rehabilitation projects (residential, hotel, office projects and railroad station)
Interior work (offices in Boston and Washington)

The involvement with all project phases, in addition, let the firm develop the means, such as dialogue and team building, for successfully coping with the diverse goals and values of the various parties involved in a building project.

Extended construction management and technology expertise

The projects undertaken by Beacon during the 1980s were characterized not only by increasing complexity in the planning and implementation (e.g. regulatory approvals, over-lapping of design and construction, coordination of multiple construction packages), but also by technical challenges. These features were found in both construction and renovation projects.

In the Rowes Wharf project, Beacon pioneered the introduction of up-down construction in New England. The technique entails considerable construction engineering and coordination capabilities, and over the years has been developed further by Beacon with its application to other projects (Becker, 1991).

The hotel Meridien project entailed a multiphased restoration and addition to the old Federal Reserve Bank. New mechanical, electrical and sprinkler systems had to be concealed and coordinated to fit within the historical architectural features, and finishes had to be restored.

Phase 4: Building for outside clients, 1988 to date

The latest period of Beacon's historical evolution is characterized by the sharp fall of the local market and, later on, the corporate change of the overall TBC group that has buoyed the growth of the construction firm.

In the late 1980s and early 1990s a deep economic recession hit the USA, particularly the New England region. A large stock of office buildings and a shrinking demand for office space triggered a downturn in the real estate market, with a consequent fall of values and tax revenues to the already financially strained local communities. The recession quickly extended to hotel and residential markets. In 1988, TBC had already halted developing new properties and sold the hotel chain. At that time, Beacon was drawing more than 90% of its sales from its sister company. Figure 3.10 shows the last large office building completed for TBC in 1989.

Beacon faced the critical decision of seeking new markets that were not affected by the recession and whose characteristics would fit its management and technical capabilities. Building upon its long association with its sister company,

3.10
75 State Street office project in Boston.

Beacon had developed unique characteristics: the ability to devise alternative delivery systems and shape partnering arrangements, an affinity for dialogue and team building with all the participants in the building process, and an expertise in successfully coping with technologically complex construction challenges in new and existing buildings. The acquisition of new outside clients, in addition, required the improvement of the firm's capability to administer construction projects, the area in which a contractor generally incurs financial gains or losses. The new president, in fact, was aware that the control of this issue was very important for the profitability of the firm, given also the more stringent contractual relationships that the firm was going to have with outside clients.

In-house marketing functions were expanded by the addition of personnel from one of TBC's divisions. Beacon successfully targeted institutions involved in health care (e.g. hospitals and research centers) and higher education (e.g. laboratories and dormitories) that own a large portfolio of properties. These organizations engage in periodic capital investment programs (new construction and renovation), but often lack in-house personnel competent in construction management matters. The timing of these investments was triggered by the economic recession by taking advantage of very competitive prices. Instead of immediately seeking traditional construction work, Beacon's strategy was to consult with these clients from the planning phase of their programs. These professionally oriented services had the purpose of optimizing clients' investment decisions, building a reciprocal fiduciary relationship and ultimately obtaining construction and renovation work.

In this phase Beacon's projects are characterized by a smaller size but of a highly complex nature. The firm was engaged in hotel, hospital, research laboratories, university dormitories, residential projects, and interior construction work. This last type of business represents the main activities of Beacon's Chicago branch. The firm, in addition, managed the up-down construction of a deep underground garage in downtown Boston. With this project, Beacon mastered the technique used for constructing the substructures of the Rowes Wharf and 75 State Street projects. At the same time, the firm has been seeking opportunities internationally, particularly in Europe, by marketing its construction and program management capabilities and exploring the possibility of self-initiated projects and alliances with local firms. These efforts led Beacon to develop cooperative contacts with a Dutch firm and, later on, the relationship with Dioguardi. Figure 3.11 shows the organizational result of this re-orientation. Of note is the presence of a new Atlanta branch, whose establishment was driven by the growing local market and 1996 Olympic Games, and whose activities focus on government-related projects, hospitals and schools.

Beacon's satisfactory economic performance and successful acquisition of new clients during recession periods reflected the rapid improvement of project administration and marketing capabilities. In the span of a few years, Beacon transformed itself from a company dependent mainly on one single internal client to a company that is aggressively pursuing projects from outside clients. Rather than targeting only traditional construction work, a market affected by fierce competition given the regional recession, Beacon has pursued large owners whose

Table 3.4 Major projects, by type and geographic location, executed 1988–1994

Hotel projects (four units, Massachusetts, Illinois, California)
Residential projects (Massachusetts)
Institutional projects (libraries, research labs and dormitories, Massachusetts)
Health care projects (Massachusetts)
Post office projects (Illinois)
Renovation/interior construction projects (office buildings, Massachusetts, Illinois)
Miscellaneous renovation projects (business and distribution centers, airline maintenance plants, Illinois)

project requirements match the management and engineering capability of the firm.

Table 3.4 lists the major projects, by type and geographic location, that were executed from 1988 to 1994.

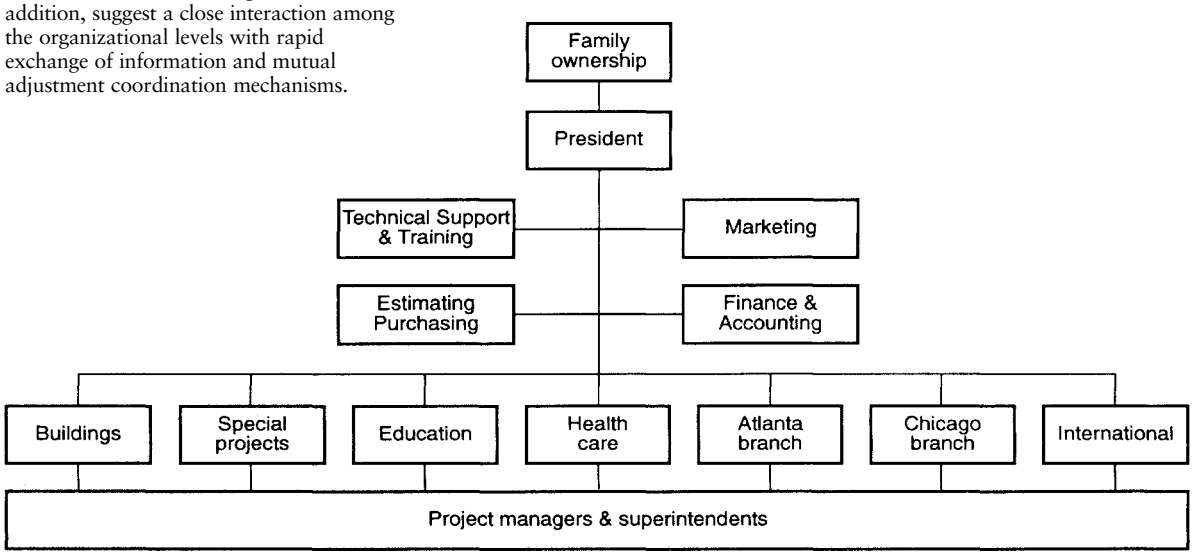
Figure 3.12 shows South Station, a refurbishment and revitalization project that was complicated by the need for keeping the railroad facility operational during construction.

The ongoing construction of the replacement facility for the existing Shriner Burns Institute in Boston is illustrated in Figure 3.13. In order to minimize disruption to patients and visitors, the existing four-story hospital is being kept in place and in operation until the replacement facility is completed above. Upon completion, the existing structure below is to be demolished and replaced with new hospital functional areas.

A growing line of work is represented by consulting services such as physical assessment, feasibility and planning studies aimed at developing building programs, in addition to traditional construction management and contracting services. This line of

3.11
Beacon's conceptual organization in the early 1990s.

In the early 1990s, Beacon's organizational structure is organized according to three levels: the president's office, which reports to the board of directors (family ownership), the support resources, and seven executive levels in charge of operations. The support resources consist of marketing, finance/ administration, estimating/purchasing and technical support/training functions. This last office consults with the firm and outside clients. Directly reporting to the president are seven vice-president offices, differentiated according to type of market and geographic location of operations. The buildings office is in charge of projects at risk. The special projects office undertakes mainly interior construction work. The education and health care offices are in charge of services, such as owner's representation, program management or consulting.
Each office draws resources from a pool of senior and junior project managers and superintendents whose activities are supervised by the vice-presidents acting as project executives during the execution of a project. The operational level is organized according to project teams, with the involvement of vice-presidents and the president himself and the reliance on the centralized support functions. This arrangement reflects a strong marketing-driven orientation, and produces flexibility in setting ad hoc organizational arrangements. The flat organizational structure and the absence of an intermediate level of management, in addition, suggest a close interaction among the organizational levels with rapid exchange of information and mutual adjustment coordination mechanisms.



3.12
Refurbished South Station in Boston.
(Photo by Steve Rosenthal)

3.13
Shriner Burns Institute under construction.

business reflects Beacon's strategic position vis-à-vis the changing nature of the construction market. An increasing number of clients seek professionally oriented services in addition to construction capabilities. In this regard Beacon actively collaborated with Dioguardi in the planning and design of the Margherita Theater project in Bari.

Beacon's organizational structure and corporate orientation have been changing again since 1994. The entire TBC group has been transformed from a set of affiliated partnerships, typical of real estate firms, into a successful real estate investment trust (REIT), which permits investors to buy shares of companies that invest in real estate. The possibility of trading shares on stock exchanges makes the REIT similar to regular corporations. The infusion of new capital through the successful sale of shares has been beneficial to the full group. It has facilitated the acquisition of new properties, and has given the construction company increased bonding capacity and, therefore, the ability to grow. This endowment could not come at a better time, because of the rebounding New England market and the good prospects of Beacon's existing operational areas: Atlanta, Chicago, and Washington with the joint award of the Italian Chancery in Washington.

The REIT's accountability towards shareholders, at the same time, has put pressure on Beacon's profitability, a challenge because the construction business generally offers lower returns than those from stock investments. Following two years of significant growth, Beacon is currently pursuing the goal of doubling its volume of sales by the year 2000. Focus on growth and profitability has been driving the organizational change of the firm, with a shift from centralization and functional orientation to self-supporting units organized according to the following business areas: Chicago and Atlanta branches, building construction, special projects (mainly interior construction) and facilities services (fee based projects).

Beacon's growth will be pursued through geographic diversification and by strengthening the operations of existing branches. The firm is aware that the Boston market is not large enough to allow it to double its sales. In this regard, the collaboration with Dioguardi will be useful. Both firms can achieve their respective goals of growth and penetration into the US market without the full risk exposure of individual undertakings.

4 Comparative analysis of the firms

Building upon the analysis of the historical evolution of the firms, this chapter compares their strategic orientation, market positioning and major organizational and management features. As stated in the preceding chapter, the comparison uses a contingency view of organizations, namely the influences of external environment, i.e. market and process, on firms and their need for structural and procedural adjustments to ensure their success. These adjustments concern the strategic orientation of firms in terms of offered services, the criteria according to which they are offered, and the supporting organizational and management capabilities (Lansley, 1987).

Current strategic orientation of Dioguardi and Beacon

Dioguardi and Beacon are experiencing differing orientations in relation to the different environments in which they operate. The Italian market environment is more predictable and less open and dynamic than the US market. As stated earlier, the supply of Italian construction services is largely influenced by the demand initiated by the public sector. Its building procurement system is inefficient, given the loose nature of the contractual arrangements and the long-standing policy of promoting construction employment and political support. This situation is dramatically changing because of the recent scandals that have involved major contractors and politicians in charge of public posts.

In the USA the demand for construction services tends to be strongly influenced by the private sector. In this context, US construction firms face a demand that puts emphasis on time and cost control, and clear allocation of responsibilities and risk. These features are also present in the public procurement system, which is subject to close scrutiny by communities.

Dioguardi has implemented a systematic expansion program based on the consolidation of the domestic market and the opening of foreign branches. This strategy was implemented by promoting quality and service, notwithstanding the fact that the public procurement system is not geared to value this approach.

Beacon has been undergoing a dramatic change in the mix of its clients, by targeting educational and health care institutions, whose value system emphasizes listening, dialogue and multi-disciplinary services from construction firms. Beacon's sales are growing again after a deep local recession. In this last regard, Beacon's marketing target may have more of a short-term than a long-term nature.

According to Porter (1980), a firm faces three generic strategies to secure a sustainable advantage in the market against its competition:

- To obtain cost advantage in the industry by pursuing a low-cost structure across the firm's entire business system. This strategy is most used in the contracting industry through approaches such as reduced overhead, investments in efficient production technologies, and economies of scale or experience curves based on increased market share.
- To differentiate the product against other main competitors by creating lines of business that are valued by clients or are perceived as being unique. Differentiation is based on approaches, such as product design or customer service, aimed at creating a unique image of the firm and charging a price premium.
- To focus on a particular market segment using either cost leadership or differentiation. Niche focus entails operating in a narrow market by performing better than competitors who operate in a broader market. It results from a balance between becoming too large and being too small to sustain a large business.

Dioguardi does not seem to pursue cost advantage policies. The firm nevertheless invests in production technologies, and seeks cost competitiveness through superior site organization and centralized coordination of purchasing.

Differentiation and niche focus are the main strategies pursued by Dioguardi. Its in-house design/engineering (rarely found in construction firms), high-quality work, organizational strength and the professionalization of its managers are typical differentiation features. They are reinforced by a corporate image, based on high-visibility projects, social participation and cultural initiatives, that makes the firm unique in the Italian construction industry.

The niche focus (or segmentation by customer) results from the long-term relationship that Dioguardi has established with a selected pool of clients, such as banks, postal and communication agencies, transportation and utilities

authorities. Traditional clients, particularly those who operate nationally, are retained with customized design services, strong implementation focus and maintenance services offered by regional branches. The marketing of the Binistar and Arclatum systems is an additional feature of niche focus. Long-term business relations with clients and design control allow Dioguardi to perform work whose conditions are more favorable and flexible than those of projects obtained through competitive bidding.

Beacon does not seem to seek a cost advantage status, given the nature of its projects, but rather to offer the best services at a given price.

Similarly to Dioguardi, Beacon pursues differentiation and market niche strategies. As a part of an integrated company Beacon draws on expertise that covers all the phases of a project cycle: planning, design control, construction, operations, and maintenance. These features, rarely found in medium-sized construction firms, make Beacon a construction services-oriented company. Customized professionally oriented services, strong management orientation, team-building attitude and high-quality work are the main differentiation features of the firm. Both Beacon and Dioguardi show a common interest in working with leading architects, thus enhancing the visibility of their work.

Beacon's focus on market niche building is narrower than that of Dioguardi. The firm, for example, does not undertake civil engineering work. This orientation probably reflects the growing segmentation of the US construction industry by specialization, and the conditions of Beacon's local market. Similarly to Dioguardi, the firm has developed a pool of clients with a large portfolio of properties to whom it offers management services in addition to contracting. These services are particularly beneficial at the inception of a project or program. Beacon's early participation in the process enhances the value of the client's investments, and facilitates the control of construction operations to the benefit of both parties. Clients are retained with customized professional services, such as feasibility studies and assistance in the formulation of a project's scope and implementation criteria, that foster reciprocal trust and set the basis for future work.

In this regard, Beacon and Dioguardi share a common feature in selling their services: helping potential clients in formulating and defining their requirements or ideas. This feature can be seen in the possible different roles of owner's representative, construction manager or contractor that Beacon assumes for servicing clients, and in its organizational flexibility.

Dioguardi instead establishes a dialogue with clients by offering promotional design services, or undertakes small and unattractive maintenance projects with the intent of obtaining a large project with the same client in the long run.

The differentiation strategy pursued by the two firms bears some risk. In the long run, the built-in price premium of differentiation may become too high for clients, or their perception of the service value may narrow, particularly if new competitors enter the markets of Dioguardi and Beacon. This risk is lessened by the firms' integrated structure, a factor that puts the firms in the position of leapfrogging competition in the long run. Dioguardi, in addition, undertakes proactive R&D activities on a continuous basis.

Both firms have diversified backward into real estate development (Beacon and Dioguardi) and design/engineering (Dioguardi) and forward into production (Dioguardi) and property management (Beacon). Initially the diversification into real estate by the two firms was probably motivated by similar factors, e.g. the possibility of additional revenues and direct access to the demand for construction services. Over the years, further diversification was pursued and motivations diverged. In the case of Dioguardi, diversification is aimed at enhancing the capabilities of the firm; all divisions service the original core business of construction. In the case of Beacon, diversification is aimed at supporting real estate investments. In this last regard, Beacon may be distracted from focusing on its autonomous core business.

As stated before, Dioguardi operates a series of regional and foreign branches. Regionalization was implemented for several reasons: the limited size of the Bari region market, particularly in regard to the type of targeted projects and clients who operate nationally; to bring the company managers closer to the marketplace and enhance their careers (particularly the young personnel); to have access to the more sophisticated production and organizational settings of Northern Italy and Europe; and to decentralize decision making. We will see later that these factors have important implications for the organizational functioning and management style of the firm.

Market positioning of the firms

Building upon their traditional construction skill, both Dioguardi and Beacon have successfully targeted the market of the pre-construction phases of a project, which consist of a variety of services: building condition assessments, code analysis, cost estimate and scheduling, project scope definition, full design

services (Dioguardi only), constructability analysis and value engineering, construction planning and logistics, financing, land acquisition, securing rights to build, purchasing strategies for construction services (Beacon only), bid documents preparation (Beacon only) and long lead procurement. These types of services are consistent with the differentiation and market niche pursued by the firms. Although both firms use these services as a marketing tool for decreasing bidding costs and ultimately securing higher-income construction contracts, the motivations and perspectives behind this common approach are different, as Beacon considers pre-construction services as an alternative and viable income source at lower risk.

Market positioning of Dioguardi

The delivery of full design and building engineering services through its design and engineering department or its long-standing professional consultants is one of Dioguardi's trademarks. These types of pre-construction services are applied to a wide range of new construction or retrofit initiatives (bank, office, hospitality and industrial facilities) in addition to the garage, airport and theater projects to be analyzed in the following chapter.

Dioguardi's design-build capability accomplishes several objectives:

- It creates a market niche with a lack of competitors. Very few, if any, Italian firms (or US firms) the size of Dioguardi have in-house design capabilities and a network of established consultants.
- By offering design services that are customized to clients' needs, Dioguardi uses the fiduciary role of the architectural profession for establishing an exclusive relationship with clients. The upfront investments in design proposals create the image of a 'different' and professionally oriented company that can be trusted.
- The in-house integration of design and construction facilitates a better control of the finished product quality and the achievement of construction efficiencies through design specifications of innovative construction methods, technologies and work procedures.

With the Margherita Theater project (the refurbishment of a publicly owned facility, to be analyzed in Chapter 5), Dioguardi's market positioning moves up at the very start of the building process, where public and private entities promote

projects: the perception of a need or an investment opportunity. This initiative is motivated by Dioguardi's long-term strategic goals rather than economic gains. In any case, it represents another market area in which the firm operates: that of self-promoted projects. On specific demand of clients, the firm offers full turnkey and property management services, from financing to maintenance, particularly in the Bari region. Once completed, the facilities are either sold or leased to clients.

Although Dioguardi is involved in hard bidding, a significant amount of its sales are drawn from negotiated design and construction contracts with public services enterprises, particularly postal, communication, airport agencies and power utilities. These commissions are facilitated by several factors:

- the clients' need of customized services on a short delivery basis, as in the case of telecommunication and post office agencies;
- the frequent use of contractual arrangements that do not need to follow the lengthy and stringent bidding procedures of public procurement;
- Dioguardi's long-standing relationship with these agencies, as reflected in more than 20 years of successful construction services for these clients.

Market positioning of Beacon

Beacon is a process-oriented firm, whose management skills and technical knowledge are reflected in its pre-construction services. Beacon's involvement with these services stems from several interrelated factors.

- The firm has been coping with a deep local recession, fierce competition and the disappearance of the large projects in which Beacon was engaged with its sister development company in the 1980s. Pre-construction services are one of these initiatives for compensating for the lack of 'anchor' projects and maintaining the volume of sales.
- Beacon has been successfully diversifying its portfolio of clients. While in 1988 95% of sales came from the sister company, in 1993 almost 90% was from outside clients. Pre-construction services are used for attracting new clients and gaining their loyalty.
- Pre-construction services on a consulting basis (in addition to those in conjunction with general contracting) are considered a promising line of business that differentiates the firm from its competitors, produces fees with less risk,

and answers a growing but implicit need of the construction market.
- The marketing of pre-construction services reflects the need to exploit the strong management skill that Beacon has developed in the past by assisting the sister company from the inception to the operation and maintenance of major projects.

In the USA (unlike Italy), the demand for construction-related services is initiated by private clients to a large extent. The bulk of Beacon's current clients are private educational and health care institutions, which operate a large portfolio of facilities with recurrent needs for new construction and rehabilitation projects. Although sophisticated, these owners need assistance in the delivery of their projects, particularly from the management and technical expertise viewpoint. In this regard, Beacon presents itself as an owner's construction representative or professional consultant to clients.

Rather than targeting traditional construction work only, Beacon gains the trust of clients by actively participating in the formulation of a project's objectives and implementation criteria early in the process. This approach has three major implications:

- It increases the client capability of influencing and controlling the final outcome of the project.
- The value that clients put on these services establishes the basis of a durable relationship and possible future work.
- Beacon's early involvement in the process allows more efficient and profitable construction operations for the benefit of both parties.

The following pages address the organizational and management capabilities that support the strategic and marketing orientation of the firms.

Organizational and functional features of Dioguardi and Beacon

According to Mintzberg (1979) an organization is characterized by five primary components: strategic apex (senior management), middle line (the management linkage between strategic apex and operating core), operating core (the organizational part in charge of transforming inputs into output), technostructure (the part concerned with the analysis, change and control of the organization) and support staff or functions. These last two parts are the administrative functions of an organization.

Construction firms, particularly of small/medium size, are generally characterized by a flat structure with an entrepreneurial strategic apex, small administrative functions (Stinchcombe, 1959), a short middle line consisting of project managers, and an operating core consisting of site personnel. In service-oriented construction firms and architectural and engineering organizations the middle line tends to overlap with the operating core.

Organizational structure

The self-sufficiency and relative autonomy of Dioguardi's branches pull the firm toward a divisionalized form of organization, a structure that is generally based on the coupling of relatively independent divisions with centrally controlled performance evaluation and resource allocation. Regional divisionalization is consistent with Dioguardi's expansion philosophy based on close contacts with local markets and delegation of authority. Technostructure and middle line are the main key organizational parts. Within the technostructure, planning and control functions emerge, given the analytical and long-term view of the firm. These functions consist of the executive committee (strategic planning), and the administration/finance department (budgeting and control). The personnel office in charge of training and professional development of the work force is another important part of the technostructure. The middle line is represented by the general manager's office and the management of regional branches. The general manager's office (estimating and purchasing) performs the critical coordination of branch operations, without which the latter would be subjected to inevitable balkanization. The operating core is represented by project managers and site personnel.

Beacon has the characteristics of a simple structure, with a pull toward professional bureaucracy given the high professionalization of its middle line. This organizational form is generally described as dominated by the strategic apex and characterized by few formalized procedures and minimal use of planning, training or liaison devices. The organizational structure is flat with an overstretched strategic apex (the president is also involved in the management of operations) and a middle line that is horizontally differentiated according to the lines of business of the company. Given the service nature of Beacon's operations, the middle line overlaps with the operating core. Among the support functions to the strategic apex, the marketing, and estimating and purchasing offices

emerge. Planning functions are not formalized, but performed through ad hoc committees that involve all key personnel and meet on a regular (monthly and weekly) basis. The short distance between strategic apex and middle line and the close positioning of the marketing office to the presidency underline Beacon's thrust toward a quick organizational response to market opportunities. The differentiated middle line shows a pull toward specialized services.

Coordination mechanisms

Dioguardi does not have a prevailing coordination mechanism. Standardization of output and skill, typical of professionally oriented organizations, seems to prevail in the management of branch operations. Their autonomy is handled with the branch managers' accountability for predetermined performance and their indoctrination into corporate culture. Vertical coordination of the middle line is achieved with overlapping responsibilities across managerial levels. Horizontal coordination among regional operations is performed by the control committee. An extensive body of protocol and work procedures is the main coordination mechanism of the operating core.

Beacon's main coordination mechanism is the direct supervision that is exercised by project executives on project managers and their assistants. The functioning of project teams and their relations with support functions, such as estimating, is handled through mutual adjustment mechanisms, particularly in projects of complex scope definition. Project managers' involvement with continuous consulting services nurtures standardization of skill or professionalism, a coordination mechanism based on the considerable autonomy of workers. The completion of this evolution needs to overcome the centralization of authority that currently characterizes Beacon's operations.

Information processing

Dioguardi's divisionalized nature entails a developed MIS, for planning and control purposes, with systematic and computerized collection and integration of data. Communication tends to be formal, and involves the extensive use of reporting procedures. Information distribution among divisions is facilitated by the control committee and the mobility of key executives. Overall, Dioguardi's information processing tends to have longer-term horizons and a higher degree of certainty than that of Beacon.

Beacon's flat organizational structure facilitates the rapid communication of information. The rapid pace and multi-interface nature of projects entail the collection, interpretation and synthesis of much data on short notice. In this context, decisions are made quickly and modified as new data are received and analyzed. Information processing tends to have shorter time horizons and a higher degree of uncertainty.

Management style and culture

People orientation characterizes the main management style of Dioguardi. The strong focus on organizational effectiveness and integration, and the development of personnel are typical features. Power of authority is decentralized with frequent consensus decision making. The corporate management system tends to have a longer-term approach to market-related issues. Considerable emphasis is put on the development and diffusion of corporate culture. Training, professional development and frequent corporate documents are aimed at sharing corporate goals and values among personnel and achieving homogeneous behavior.

Task orientation is the main management style of Beacon. Efficiency and managerial control are typical features. Power of authority is centralized. The perception of the external environment as unstable leads to managerial orientation toward short-term results (a common feature in the US corporate culture). Key executives tend to be directly involved with production, in addition to directing or coordinating subordinates. A strong work orientation permeates Beacon, with a focus more on the individual development of entrepreneurial and management skills than on the homogeneous development of the overall organizational culture.

Organizational capabilities

During project development and execution, particularly with repetitive clients, Dioguardi emphasizes the control of the project environment in order to maintain a strong implementation focus. The project environment consists of many participating organizations and individuals who affect its evolution. Multiple technical interfaces and the negotiation of diverse organizational interests may slow down the project progress and dilute the technical/economic targets of the firm. In this regard, Dioguardi 'protects' its internal workings by internalizing several critical project activities, such as site acquisition and development, and design and engineering. This

approach decreases the number of external influences on the firm's delivery of services, but in the long run may nurture the build-up of inertia to new organizational requirements imposed by environmental changes.

With its clients Beacon emphasizes role flexibility in order to successfully cope with a variety of contractual arrangements. By acknowledging the multiple-interface nature of the building delivery process and the blurring of traditional roles and responsibilities, Beacon assumes the role of professional consultant, construction manager or contractor according to the contingent requirements of clients and projects. Role flexibility marries a similar capability in setting project team organizations. This overall organizational flexibility reflects the firm's readiness to a prompt adjustment to environmental changes.

Notwithstanding their different environments, both Beacon and Dioguardi pursue similar differentiation and market niche strategies by offering services in the pre-construction phase of a project, besides the traditional general contracting services. In this connection, Dioguardi deploys the full extent of its integrated organizational strength by internalizing activities such as planning and design. This orientation is supported by the decentralized marketing and executional role of branches and the centralized support and coordination functions of the headquarters. Capabilities are applied in an almost systematic fashion given the relative predictability of the Italian construction demand in terms of project delivery systems.

Beacon's capability of playing different roles in a project matches the unpredictability of the US project environment, particularly in regard to its delivery criteria. Beacon's flexible and flat structure allows rapid adjustments to demand changes. Differently from Dioguardi, pre-construction services are considered as a viable line of business, without the high risks imposed by construction contracts. This orientation reflects the relatively high development and sophistication of the US construction process and market.

The following chapter expands the discussion of the firms' characteristics by analyzing their technical and managerial capabilities in the execution of six projects and the criteria according to which these capabilities are offered and deployed.

5 The operation of the firms: analysis of six projects

This chapter presents a case study of six recent or current projects, which show the firms' current strategic orientation of their operations, their technical and managerial capabilities, and the criteria according to which these projects are executed. The analysis of these matters is important for building on complementarities and synergies, capitalizing on opportunities for possible collaborative undertakings by two firms and defining the market profile, whose requirements fit their joint capabilities, as will be described in Chapter 7.

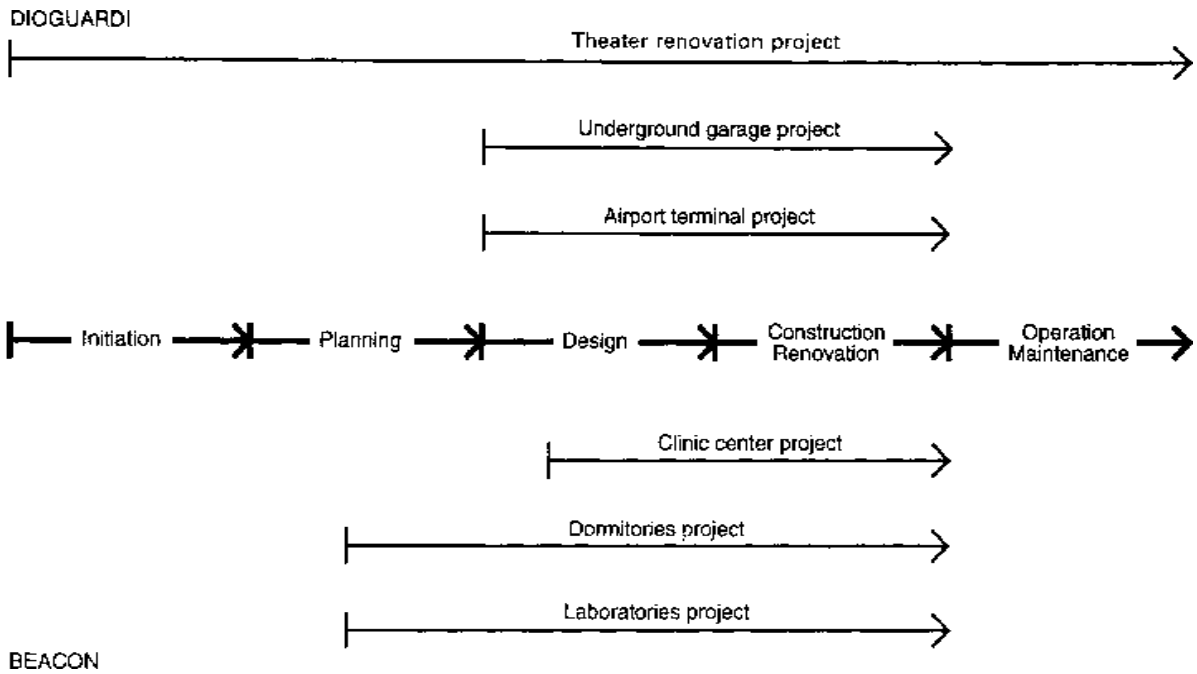
Beacon is a process management-oriented firm, whose capabilities are enhanced in projects of a complex nature and multiphased delivery. Dioguardi is a firm with a strong implementation focus. This capability is enhanced in projects in which Dioguardi undertakes the full gamut of its design and construction services.

The projects illustrated show unique service-oriented cultures and capabilities that differentiate the firms from their competitors. The discussion reflects the following focus of analysis: the characteristics of the project, the problems faced by the client, the proposed technical and organizational solution, the capabilities of the firm and its personnel, and the criteria used by the firm in obtaining the job.

The contexts of the projects

The three projects undertaken by Dioguardi are the construction of an airport terminal in Milan, an underground garage in Naples, and the renovation of a theater in Bari. Their scattered locations reflect the wide geographic distribution of Dioguardi's operations. The projects undertaken by Beacon are renovation programs for university laboratories and dormitories, and the construction of a clinic center. All projects are concentrated in the Boston area.

Figure 5.1 shows the positioning of these projects along the building delivery process and the type of tasks undertaken or managed by the firms. The use of initiation, planning and design capabilities by Dioguardi is aimed at obtaining construction



5.1
The positioning of the projects by Dioguardi and Beacon along the building delivery process.

work and facilitating its execution. Beacon's program management capabilities, as used in the planning and design phases of the dormitories and laboratories projects, show that these services can generate income, in addition to the revenues from possible construction services performed later, in the delivery process of a project.

Dioguardi's projects have a relatively stable scope definition process because of the wide delegation given by clients during design. Such a stability leads to the strengthening of Dioguardi's implementation capability. Less defined project documentation and looser outside control procedures allow more room for deviations but a more straightforward path toward execution.

Beacon's projects proceed through a difficult and changing scope definition process that requires possible reversals and robustness in the management role. Strict cost and time objectives allow less room for mistakes, and entail tighter project procedures.

Dioguardi's clients tend to value the quality of the finished product more than cost and time results. Credibility of Dioguardi in terms of design and construction services is a major selection criterion.

Beacon's clients tend to value the quality of service and the ability to deliver it. Schedule and cost results without

compromising the quality of the product are main selection goals.

Dioguardi's Linate Airport project, Milan (1991–1993)

The project, consisting of a major expansion and rebuilding of the passenger terminal at Linate Airport, was a negotiated contract, and it was completed in March 1993. The client was Società per gli Esercizi Aereoportuali (SEA), a public agency (90% owned by the municipality of Milan) that manages all of the operations of the two Milanese airports. As in other cases, the acquisition of the project was facilitated by two main steps taken by Dioguardi: strengthening the long-term business relationship with the client, and promoting a design and technical proposal at its own expense. Dioguardi had worked for SEA in the past (1981) at Malpensa (the second airport of Milan), and was eager to work at Linate. In the late 1980s Dioguardi was also aware that the airport market was going to grow. A national airport expansion program was being enacted (Italy was the host of the 1990 World Cup), and, in any case, new EC directives demanded a modernization of Italian airports.

In the fall of 1990, Dioguardi seized the opportunity to work at Linate by bidding and winning a contract of a modest amount, related to the ongoing expansion of the airport. During the execution of the contract, it became clear that the client had major needs beyond those met with the ongoing project, particularly in regard to the improvement of the departure- and arrival-handling capabilities of the terminal. This improvement was to be achieved with the use of flying bridges, a device used only at Fiumicino airport in Rome. The construction activities, in addition, could not interfere with airport operations, and had to be completed in early 1993.

In a very short period, Dioguardi translated these needs into a proposal that consisted of a schematic design solution, a construction plan, a price offer that was based on the same unit costs as in the previous contract, and a model. The proposal involved the entire front of the passenger terminal with the addition of a service basement throughout, and the addition of a three-story square building on top of the existing structures.

The design solution and the construction plan entailed the participation of the client, who set the functional layout and the operational priorities of the terminal during construction. In this regard, the development of the proposal induced the client

to define his needs. This phase was also characterized by the participation of the internationally known Milanese architect Aldo Rossi, who packaged the proposal from the architectural point of view. In practice, the functional layout was encased in a 'box' sketched by Rossi. In July 1991, the proposal was presented to and accepted by the board of directors. It was agreed that Dioguardi would execute the final design and construction work. Between July and November, the design proposal and the terms of the contract were further developed and discussed with the client. The contract documents contained approximately 100 drawing sheets (A0 format), and were signed in November 1991. From this moment on, the development of working drawings and construction activities proceeded in parallel in a fast-track mode. The final architectural drawings (approximately 200 sheets) were developed in-house by transferring personnel from the Rome and Bari design departments for several months. Dioguardi personnel, in addition, coordinated the work of the structural and mechanical consultants (200 and 300 sheets respectively), as well as the shop drawings of the steel erector (300 sheets).

The major challenge of the construction project was the execution of the work without interrupting or disrupting the terminal operations in a site with space constraints. Figure 5.2

5.2
The Linate Airport site at the start of the project. The crane's position shows the area of the new terminal main building under construction.

shows the existing terminal. Once a new area was constructed, temporary structures had to be provided in order to ensure the operational efficiency of the terminal. The plan, implemented during the proposal development, called for a piecemeal approach. Overall, a series of 30 interdependent phases (of which 13 were for interior construction) had to be implemented. The further development of design, in addition, had to be coordinated with the phasing of the construction work.

From the technical point of view, the most challenging task was the construction of the square building that was practically constructed around and on top of the existing structures. Its floors were hung from six 144ft (44m) steel beams located on top of the building, and whose weight ranged from 100 to 120 metric tonnes. The six components of each beam were assembled and welded in a nearby hangar with two 10-hour shifts of welders. For security and air traffic reasons, the erection of the beams had to be executed at night with an 800-tonne crane, supported by another 400-tonne tower crane, as shown in Figure 5.3.

The full project was executed by a consortium of contractors

5.3
Night erection of a 120 tonne steel beam for the main terminal building at Linate Airport.

(one HVAC, one electrical and one mechanical), headed by Dioguardi acting as a general contractor. The five flying bridges were contracted to a separate firm by the client. The $20 million construction package was awarded to Dioguardi on a unit cost basis with a 28-month duration for design and construction. The contract, in addition, provided Dioguardi a fee for design services and construction coordination.

The project was almost completely subcontracted to a group of 30 specialty contractors and suppliers. Procurement was handled by the purchasing department of the Milan branch.

A team of 10 Dioguardi employees was involved in the execution of the project. The project manager and one assistant (added during construction) participated in the proposal, and coordinated design development and construction planning. Two superintendents and relative assistants were in charge of the execution of the work (one team for the squared building and the other for the remaining part). A team consisting of three bookkeepers was in charge of cost control and accounting, and billings to the client. An additional employee was in charge of drawing and data filing and recording.

Dioguardi's Margherita Theater project, Bari (1992 to date)

The Margherita Theater is an architectural landmark listed in the national register, and a focal urban point at the intersection between the sea promenade and the two most important and congested avenues of the city of Bari. Given the continuous traffic congestion, the theater area is not easily accessible to pedestrians. Completed in 1914 under the sponsorship of local businessmen, its concrete structure is supported by foundation piles in the sea. Conceived initially as an entertainment and variety show center, the theater soon became an integral part of the social and cultural life of the city. The theater is owned by the Ministry of the Merchant Navy, and, in the past, was rented by entertainment operators with long-term leases. In 1979, after a period of slow physical decay, the theater (at that time used as a cinema) ceased its operations, with consequent further degradation of the surrounding urban area. Uncertain revenues from the use of the facility and lack of public funds for the needed renovation were the main reasons for its permanent closing. Over the years, several renewal proposals had failed, due in part to the inertia of the local public authorities. In late 1989, the management of Dioguardi, whose headquarters is a short distance from the theater, thought that something had to be done about reversing its

physical and economic obsolescence. The attention to this matter was not unusual, given the long-standing civic role of Dioguardi in the city of Bari: as a major private employer, as a sponsor of cultural events and educational programs, and as a main promoter of an important technological park, among others. The possible commitment to the project would reinforce the links with the community, and would continue the image of the firm. The project could be the occasion for reconciling community interests and business objectives.

Dioguardi was aware that the initiative was not a normal project. It was an ambitious undertaking that had never been experienced in Italy and that presented unique problems: the financial feasibility of the project, subjecting it to the availability of private investors and revenues from future operations of the facility; the renovation of an architectural landmark with stringent regulatory constraints; the renewal of a vital but neglected urban area, with the untangling of several public jurisdictions; and the expectation and scrutiny of the local community, which for many years could not enjoy the use of the theater. The start of the project, in addition, required a significant upfront investment in return for uncertain future revenues.

After preliminary contacts with the owner in January 1990, the negotiation continued for a long period until mid-1991, when a tentative agreement was reached. In July 1992 Dioguardi signed a one-year lease with the local harbor master's office, acting on behalf of the owner. As part of the agreement Dioguardi was to execute urgent structural repairs and, in one year, develop a technical plan and financial program for the renewal and reuse of the theater. After the repair work, the structure was wrapped with a scaffolding system supporting a trompe l'oeil of the original facade and colors of the theater. The function of the device, according to Dioguardi, is to make sure that the image of the theater, an important visual point of Bari's landscape, is not forgotten in the minds of the community. Figure 5.4 shows an aerial view of the theater wrapped with the tromp l'oeil.

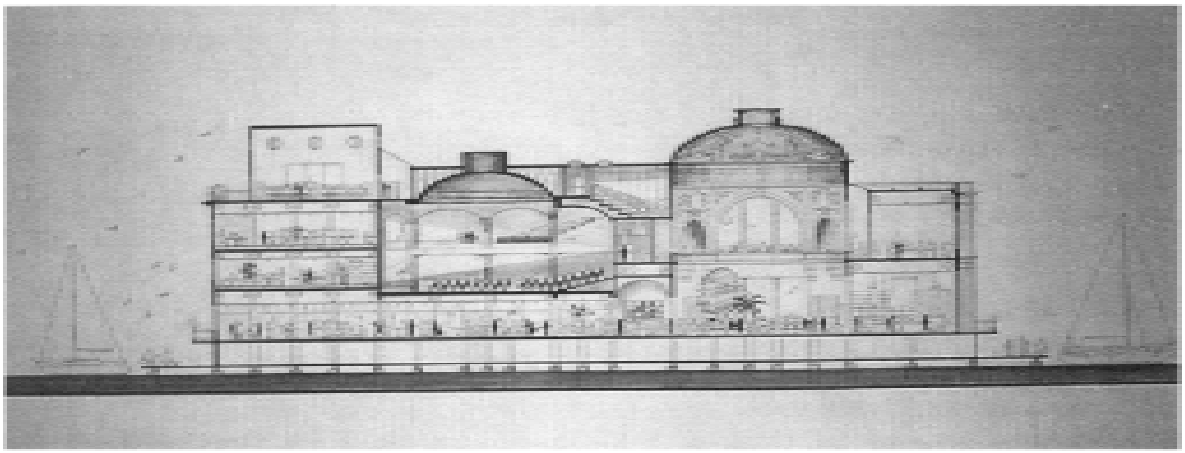
The project, financed by Dioguardi, was developed according to several interrelated thrusts:

- The need for a successful financial program based on upfront private investments and sufficient future lease income to service the mortgage payments. Preliminary studies had shown a long payback period of the investment, and the need for controlling operating revenues and costs. Consequently, Dioguardi was seeking a very long-term lease from the owner (an arrangement not uncommon with state

5.4
Aerial view of the Margherita Theater.

properties in Italy). Dioguardi was also looking for equity investors or upfront capital commitments of anchor tenants.

- The reconciliation between the type of space use required to attract tenants, the historical, social and cultural role of the facility, and the expectation of the building regulatory agencies, namely the local branch of the Monuments and Fine Arts Service and the Department of Public Works of the city. The initial plan calls for three main uses of the Margherita's space: services for communication; cultural and entertainment events through the creation of a multifunctional room (theater, cinema and conferences); restaurants, cafes and retailing. Figure 5.5 is a longitudinal section of the theater that shows its proposed functional use.
- The conception of a restoration plan aimed at preserving the external and internal features of the theater in collaboration with the Monument and Fine Arts Service. For this purpose, all structural remedial work (high-strength mortar and stainless steel) is to be hidden within the existing masonry structure.
- The creation of a pedestrian area around the theater in order to ensure the continuity of the seafront promenade and easy access from the abutting urban areas. The plan calls for the



5.5
Proposed functional organization of the Margherita Theater's space.

burying of the adjacent vehicular traffic to be negotiated with the municipality.

- The establishment of communication channels with the local community in regard to the progress and direction of the project. The difficulty of the task is complicated by the high social profile of the theater (one of the symbols of the city) and the moodiness of public opinion, after so many years of physical neglect of the facility.

The development project was undertaken by a multidisciplinary team coordinated by Dioguardi. The structural, architectural and urban renovation project was headed by an internationally known architect, Renzo Piano, with the participation of Dioguardi's design department, two local architectural and structural engineering firms, two architectural history and urban sociology consultants, and some local public authorities. A second team, headed by the local branch manager and composed of a full-time project manager and two outside consultants, was in charge of the administrative, financing, leasing and public relations aspects of the project. In this connection, a Beacon team actively assisted Dioguardi in developing financial, engineering, and space planning/leasing studies.

The final project was presented to the community, public authorities and press at the end of the one-year lease (July 1993) in the hall of the theater. The event was accompanied by an exhibition and the publication of a book on the project. Not considering internal costs, to date Dioguardi had invested more than $700 000 in the project.

Dioguardi's Monte di Dio parking project, Naples (1990–1994)

The 192-car underground parking garage was constructed in an area adjacent to a major project, an intercontinental telephone exchange station that Dioguardi had built in the past for the same client, Società Italiana per l'Esercizio delle Tele-comunicazioni (SIP). Under the current name of Telecom, the state-owned agency operates the Italian telephone network. The project was a complex undertaking given the nature of the subsoil, the very tight conditions of the site, enclosed by the above-mentioned SIP facility (see Figure 2.2) and residential buildings, and difficult logistics, caused by the narrow dimensions of the one access street.

The six-story garage reaches a depth of 65ft (20m), with the last three stories immersed into a stratum of tufa, which is characterized by cavities and underground passages. This problem required the driving of some foundation piles down to 100ft (30m). The limitations of the site area, approximately 12000ft^2 (1100m^2), were approached with a top-down construction technique. The sequence started with driving concrete micropiles (approximately 700), which constituted the skeleton of the permanent foundation wall and inner structural columns of the garage. Successively a reinforced concrete slab, 2.5ft (0.76m) thick, was poured on grade. The slab became the temporary staging area for cranes, hauling trucks and concrete mixers. From below the completed slab, the subsoil was removed in a mining-type operation. The cycle was completed by excavating up to the level of the next story below and constructing the bearing structure of the upper story. The construction of the last three stories was different. Structural beams were poured first. Their spacing created enough headroom for the excavation machine of the tufa. After the completion of the excavation below, a concrete floor was poured on the upper beams. During construction, all garage stories were hung from the grade slab. After their completion, the direction of structural loads was reversed. The characteristics of the structural layout and underground excavation entailed a complex process of planning and sequencing for limiting inefficiencies in construction activities and in the use of the excavation equipment, crane and hauling trucks. Figure 5.6 shows the constrained conditions of the construction site. A system for monitoring possible deflections of the retention wall was implemented by BRE (Building Research Establishment, UK).

Because of all the above-mentioned process characteristics

5.6
Site conditions of the SIP underground garage in Naples.

and requirements, the design of the garage was construction driven, and could be implemented only with the input of a specialized contractor like Dioguardi.

In this project Dioguardi acted at the same time as designer, contractor and construction contract administrator. This arrangement reflected a trustful relationship between Dioguardi and the client. This relationship was built up with a stream of successful projects by Dioguardi for the client in the past. In Bari, for example, Dioguardi had been completing a major SIP complex with a similar arrangement. During the construction of the Naples exchange station, it soon became clear that the surrounding crowded urban area would have created parking problems for SIP employees. The agency, like many other state bureaucracies, is burdened by statutory procedures that slow down the execution of new projects. The

prospect of having a single source of responsibility with Dioguardi and, above all, of shorter project duration have brought benefits to SIP.

In 1987, following a very informal agreement, Dioguardi's design department developed a design proposal at its own expense. After the client's approval, the project received the building permit at the end of 1989. In early 1990 a negotiated contract was signed with SIP. The agreement called for payments on the basis of lump sum and unit costs and a fee for design services and construction contract administration. Three main subcontractors (micropiles, excavation and concrete, and electrical and mechanical systems) participated in the project. The Dioguardi team, drawn from the Naples branch, was composed of one project manager (who also acted as construction contract administrator), one superintendent, two accountants, one crane operator and two construction workers.

The garage project is a typical example of the marketing approach that Dioguardi implements toward its clients. SIP, like many other Italian public agencies, often does not have (or does not want to use) in-house capabilities for progamming needs, planning new projects and controlling their execution in a systematic way. This reasoning can be extended to the management of their huge real estate portfolio. In this regard, Dioguardi undertook a new design project for SIP aimed at the revitalization of a valuable Naples area that had been overlooked by the client in the past. The capability of interpreting and anticipating clients' needs, developing an implementation plan on short notice that contributes to corporate goals and offers a customized and unique service, puts Dioguardi in a privileged position vis-à-vis its competitors in obtaining negotiated contracts.

Beacon's MIT Facility Assessment Study, Cambridge (1992–1996)

The study focused on the physical and functional assessment of two university buildings and the development of the possible scope of the work for their renovation and improvement. The buildings' 257000ft^2 (24000m^2) gross space contains a mix of academic research laboratories, offices and classrooms, and is occupied mainly by the Department of Biology. In 1991 the client, Massachusetts Institute of Technology (MIT), was planning to partially vacate the two adjacent buildings, given the ongoing project of a new biology complex on campus. The reassignment

of space involved three additional buildings whose conditions were addressed in Beacon's study. Since their construction (1952 and 1965) the buildings have been subjected to slow physical and functional obsolescence, because no significant revamping or replacement work had been performed. MIT faced the decision of programming the future space use without a prior comprehensive knowledge of the physical state of the buildings and their functional capabilities. This last need was particularly important because it would have allowed the Institute to match the level of space serviceability (achievable after renovation) with the variable service requirements of the possible research and academic activities that could be moved into the buildings. The facilities, in addition, had to be operational during the academic year, and renovation work had to be phased in small chunks.

The scope of the study, completed in a four-month period, included the following tasks:

- The survey and assessment of the physical conditions of the building exteriors, interiors, service systems (HVAC, electrical and plumbing systems), and life safety and protection systems. Figure 5.7 shows a summary table of the conditions of the building in relation to conformance with standards for academic research activities and building codes, and remaining useful life.
- The development of alternative renovation plans that remedy building deficiencies, address building code issues, as they apply to alteration work, provide improved building performance and ease of maintenance. These plans include construction strategies and phasing that take into account the operational efficiency of the Institute during renovation work.
- Detailed cost estimates of various alternative renovation plans that also include the premium cost of working in occupied spaces.
- Definition of possible renovation options vis-à-vis costs and achievable benefits, in order to give the client decision flexibility in relocating alternative academic and research activities.
- A series of recommendations that shows the client the roadmap of future decision-making milestones in regard to the project implementation.

The commission of the study to Beacon stems from a long-standing relationship and contacts with the client. In addition to several other successful renovation and construction projects, this close relationship has been reinforced, among other reasons, by having several MIT graduates among Beacon

personnel, by the ongoing involvement of two Beacon executives in teaching at the Institute, and by past and present endowments and scholarships offered to MIT faculty and students by Beacon. This background facilitated the preliminary contacts with MIT officials.

Differing from typical design and construction services, the MIT project undertaken by Beacon had a slippery scope that required frequent interaction with the client. This situation is typically found at the inception of every project when lack of information limits the accuracy and focus of decision making. The service offered by Beacon aimed at helping the client to decide about objectives, costs and benefits and courses of action by defining alternative renovation options and at the same time outlining a decision-making methodology for discriminating among these alternatives. The methodology is traceable to Beacon's study report to MIT.

The study was conducted by an interdisciplinary team composed of six outside consultant firms and Beacon personnel in coordination with MIT officials. The former were in charge of architectural, structural, service systems, cladding systems, code compliance assessments and asbestos removal procedures. The Beacon team was headed by one project executive (i.e. a senior project manager) and one project manager with an assistant. This team was supported by three other Beacon employees for cost estimating, construction phasing and code compliance. In 1994 MIT issued a request for proposals and, successively, it hired Beacon as the owner's construction representative of the $40 million project.

Beacon's Clinical Center project, Beth Israel Hospital, Boston (1992 to date)

The project is a new $100 million complex for mixed use medical space with facilities for ambulatory care, radiology technology, physical therapy, conference center, parking garage, cafe and retail uses. The new complex is to be housed in a 12-story tower (380000ft^2, 35000m^2), which incorporates the restored historical facade of an existing building and a five-story underground garage for 750 cars. Figure 5.8 shows the building under construction.

The complexity of the construction project is reflected in:

- the different technical requirements of its main components: the demolition of an existing building and the preservation of its historical facade, the construction of the underground garage, the erection of the tower, and its fitting out with a variety of advanced service systems;

Deficiences in Building Systems

Lab Standards	*Building Code*	*Useful Life*
These items do not meet current standards for academic research and teaching laboratories.	*This list includes major items which do not currently meet building code standards. Unless action is indicated, compliance will be required when alterations are made to that building system. Handicapped alterations are required if those changes are greater than 25% of the building value or greater than $50,000.*	*Provided there are indications of the remaining useful life of building components. Factors which were considered include condition and damage, frequency of required repair or replacement, and ease of operation.*
Envelope and structure		
1 Structure – floor loading and floor-to-floor	1 Structure – no issues	1 Structure – 50+ years
2 Roof – no issues	2 Roof - no issues	2 Roof – 3 to 5 years; delamination and flashing damage
3 Curtainwall – single glazing in Building 16 creates discomfort at the perimeter in cold weather	3 Curtainwall – single glazing in Building 16 and uninsulated spandrels in both buildings (Energy Code)	3 Curtainwall - 5 to 10 years; air, but no water, infiltration detected
4 Entrances – no issues	4 Entrances – panic hardware missing or not functional	4 Entrances – 3 to 5 years; seals and hardware worn out
Circulation		
1 Lobbies – no issues	1 Lobbies – no issues	1 Lobbies – new finishes required
2 Corridors - no issues	2 Corridors – non-lever hardware in both buildings; doors swing inward in Building 16	2 Corridors – new finishes required; lighting is substandard
3 Elevators – no freight service above fifth floor	3 Elevators not accessible (ADA)	3 Elevators – 0 to 5 years
4 Stairwells – no issues	4 Stairwells – handrails do not meet accessibility standards	4 Stairwells - no issues
5 Bathrooms – no issues	5 Bathrooms – not accessible	5 Bathrooms – 5 to 10 years
Mechanical		
1 Perimeter heat – inadequate in Building 16	1 Perimeter heat – no issues	1 Perimeter heat – 0 to 5 years; leaks and faulty valves
2 Air handling presently 100% outside air, quantity of fume hoods is at maximum	2 Air handling – no issues	2 Air handling – 0 to 3 years; equipment failure and frequent repairs
3 Cooling - constant temperature rooms use domestic water (costly)	3 Cooling – domestic water source no longer allowable	3 Cooling – 0 to 3 years; leaks and faulty valves
4 Exhaust – acceptable	4 Exhaust – no issues	4 Exhaust – fan and duct life not determined
5 Controls - no issues	5 Controls – lacks hood sash tracking	5 Controls – 0 to 3 years, inadequate to proper building management
Electrical		
1 Transformers and service 120/208 V service in Building 16 is not suitable for modern laboratories. Location blocks plan for future building deliveries and lobby	1 Transformers and service – electrical room in Building 16 lacks second means of egress	1 Transformers and service – 10 to 15 years
2 Distribution – no issues	2 Distribution – no issues	2 Distribution 10 to 15 years
3 Lighting – low and uneven lighting levels	3 Lighting - possibility of PCBs in ballasts	3 Lighting – 3 to 5 years

Lab Standards	*Building Code*	*Useful Life*
Plumbing		
1 Domestic water – no issues	1 Domestic water – lacks backflow preventors and vacuum breakers	1 Domestic water – 5 years; faulty valves
2 Hot water – no issues	2 Hot water – lacks separation between bathrooms and labs	2 Hot water – 5 years; problems with converters
3 Sanitary waste – no issues	3 Sanitary waste – no issues	3 Sanitary waste – 10–15 years
4 Lab waste and venting – equipment not individually vented	4 Lab waste and venting – equipment not individually vented	4 Lab waste and venting – not determined
5 Vacuum system – not available to all labs in Building 16	5 Vacuum system – no issues	5 Vacuum system – not determined
6 Pure water – piping is aluminium rather than PVC; not recirculating	6 Pure water – no issues	6 Pure water – not determined
7 Water fountains – no issues	7 Water fountains – not handicapped accessible	7 Water fountains – no issues
Life safety and fire protection		
1 Fire alarm system – no issues	1 Fire alarm system – lacks most features of high-rise system especially connection to central MIT system, communications and ADA features (must do now)	1 Fire alarm system – full replacement required by code
2 Sprinklers – labs not fully sprinklered	2 Sprinklers – partial system does not comply with high-rise code (must do now)	2 Sprinklers – full replacement required by code

5.7
MIT facility assessment study: summary of the physical conditions of building systems.

- the construction phasing of these components in a tightly confined site and the coordination of multiple contracts;
- the changing nature of the perceived space needs by the client and its impact on the coordination of design development and construction planning.

In this project, Beacon acts as the owner's construction representative on the basis of a fixed fee and reimbursable expenses. With this agency role, Beacon provides management, administrative and related technical services necessary to assist the client throughout the various phases of the project.

At the inception of the project, Beacon assisted the client in developing a master strategy for the project delivery process that addressed issues such as the technical diversity of the construction components, phasing criteria for their realization and relative design schedules, the possibility of multiple construction packages and coordination of relative documentation. According to Beacon, the upfront consideration of these issues is crucial for achieving the quality, time and cost objectives of clients. This is the moment of the project life when

5.8
Clinical Center at Beth Israel Hospital under construction.

opportunities are higher for influencing its successful outcome and maximizing its value.

The strategy developed by Beacon encompassed several coordinated solutions that reflected management and construction technology capabilities. The project was conceived as a phased delivery of four sub-projects: demolition and restoration, underground garage, shell of the tower, and its fit-out.

Given the diverse technical requirements and constraints imposed on the design schedule, a phased release of four separate construction packages was envisioned. This solution had the advantage of creating a fit between construction requirements and contractor expertise, of fostering lower prices because of the large number of competing qualified contractors, and of synchronizing contractor commitment with design document completion. The implementation of the phased delivery, in addition, entailed careful coordination of design documents, effective sequencing of construction activities and overall project control by Beacon.

The phasing of the construction project needed to be coordinated with the proposed construction technique. In this regard, Beacon's role was instrumental in the adoption of the combination of up-down method and slurry wall in the construction of the garage. This technique combines technical and financial advantages. It matches several requirements in relation to excavation activities: the erection of the retention and foundation walls and the constrained site conditions (e.g.

the preservation of the adjacent facade). At the same time, it offers financial benefits to the client because of the overall shorter duration of the project.

Within the general contraction of the New England construction market, in the early 1990s, the strong demand of health care facilities was one of the few bright spots. Beacon targeted this market in those years by obtaining several contracts with leading institutions. The contract with the Beth Israel Hospital was facilitated by two main factors: the past and present consulting expertise by Beacon personnel with the hospital's projects and operations, and Beacon's good reputation among the designers engaged in the project. In practice, Beacon's hiring was initiated by advising the architectural team on the constructability of a previous separate design project. During the design of the Clinic Center, it became clear that Beacon's demonstrated construction capabilities could be combined with its management expertise for setting up a successful strategy for the project delivery. The firm, in addition, was well suited for the role of the owner's construction representative, because of its long experience as an 'owner's builder' with its sister real estate development company.

The Beacon team involved in the project is headed by a project executive in charge of the major management activities of the project, such as delivery strategy, purchasing and negotiation of construction services, project costing and scheduling, evaluation of construction methods and the on-going coordination with the client and design team. Some of these tasks are executed in collaboration with or under the supervision of Beacon's president.

The management capability and interpersonal skill of the senior project manager were crucial for the negotiation of frequent design changes of the construction schedule, and, at the same time, for building the right chemistry into the project team, so that individual goals did not compromise overall goals. One project manager and his assistant are in charge of the daily operations, particularly the overseeing and coordination of the multiple construction contracts. This management nucleus was supported by two staff personnel on a part time basis for subgrade construction, and project documentation and construction inspection.

Beacon's Thayer Hall project, Harvard University, Cambridge (1993–1995)

The Thayer Hall project consisted of the renovation of an 1870 Victorian-style dormitory that is located at the northeast corner

of Harvard Yard, the famous open space bound by some of the oldest dormitory landmarks of the university. The poor physical conditions of Thayer Hall required extensive exterior and interior interventions in order to lessen the physical obsolescence and lengthen the functional life of the four-story building. The restoration of the brick facade and its ornamental stones, the replacement of the slate roof and almost 300 windows were the major components of the exterior work. The repair and renovation of the inner space, 53000ft^2 (5000m^2) with 65 suites, required significant changes in the circulation and structural layout. The building, in addition, was required to meet the criteria of the American Disability Act (ADA) and current building codes. Updated electrical, ventilation and heating systems, new ceilings, flooring and doors together with the installation of fire safety and dedicated LAN systems and the addition of new living quarters were some of the major tasks aimed at creating a more comfortable and safe environment for students. Figure 5.9 shows the refurbished dormitory.

The $7 million project was part of a larger multiyear program that Harvard University has been undertaking for the upkeep of

5.9
Refurbished Thayer Hall at Harvard University.
(Photo by Steve Rosenthal)

more than a dozen historical freshman dormitories. In this project, Beacon acted as a general contractor with a guaranteed maximum price contract. The selection of Beacon, however, was the result of a series of previous customized services that facilitated the client in coping with the technical, organizational and scheduling intricacies of the renovation program and, at the same time, in developing a capital plan within realistic budget parameters. In this regard, Beacon was involved with the client throughout the various phases of this program, from its inception until its present implementation. The selection of the firm also reflected its successful performance in the construction of a 115-room hotel in 1991 that is owned by the university. In December 1991, Harvard hired Beacon to develop a study whose goal was the assessment of the existing conditions of 11 dormitories, the development of alternative scopes of renovation work and their relative cost. The study considered three levels of intervention:

- Level 1, Correction of physical defects, work required to attain minimum standards;
- Level 2, Added scope for enhanced performance, improved appearance and easier maintenance;
- Level 3, Further improvement of performance, improved appearance, and easier maintenance.

The study met two important needs of the client: it provided the basis for a systematic approach to the renovation of all buildings, and it established a realistic budget, which could inform the development of design solutions. In the second phase of study, Beacon developed the recommended scope of the work and the detailed cost estimate for each building as well as a general implementation plan with a prototype schedule for all buildings. Figure 5.10 shows a summary of the recommended scope for several building systems of Thayer Hall. The plan required the conciliation and balance of diverse objectives that impacted on the scheduling and phasing of the work, e.g. minimization of disruption to adjacent dorms and yard, matching construction and academic schedule requirements, prioritizing urgent repairs, and grouping projects for bulk purchasing. By emphasizing schedule and scope options over single solutions, the study gave the client the possibility of a flexible implementation of the capital program.

Building upon the scope of the work and the budget recommended in the Beacon study, in June 1992 Harvard issued a request for proposals for the pre-construction services of four dormitory projects. In this regard, the university had a long-standing policy of awarding construction-related services

Thayer—Systems: Recommended scope

Level 1	*Level 2*	*Level 3*
Sprinklers		
Complete code-compliant sprinkler system; including a new service and back flow preventer. Includes a stand-pipe system.	*Same as Level 1*	*Same as Level 1*
Plumbing		
Replace water service; replace valves with ball valves on domestic water lines; replace faucets, mixing valves and flush valves. ***Clean sanitary lines.***	*Same as Level 1*	*Same as Level 1*
Heating and Ventilation		
Repair all pipe insulation; test steam traps and repair pipe leaks; inspect and clean heat exchangers; inspect, repair and calibrate condensate receiver and meter and hot water circulators; check control device operation.	Replace worn steam piping and pressure-reducing valves; replace those heat exchangers, condensate receiver pumps and controls and hot water circulators with marginal life expectancy remaining; install temperature controls.	**Provide new central-plant control of temperatures. Convert 2-pipe steam systems to hot water.**
Electrical		
Ground existing receptacles, and increase number to current minimum code standard. Replace fuse panels with circuit breakers. Evaluate transformers. Connect existing emergency system to new central source.	**Install new services, main disconnect, distributions panels and circuit breaker panels; replace all wiring. Replace existing emergency lighting with new emergency lighting and exit signage systems.**	*Same as Level 2*
Emergency Power		
Fire Alarm System		
New *code-compliant* fire alarm system	*Same as Level 1*	*Same as Level 1*
Asbestos		
Minor repair and removal of asbestos containing insulation for installation of control valves. Removal and disposal of approximately 10–15% of VAT.	Removal of asbestos around valves.	**Total removal of all known asbestos materials throughout building. Total removal of all VAT and mastic throughout building.**

5.10
Building assessment study of Thayer Hall: summary of the recommended scope for sprinkler, plumbing, heating and ventilation, fire alarm system and asbestos removal.

to different contractors. The good performance of these services was the basis for the award of the construction contract. Beacon made a successful proposal for Thayer Hall, the largest of four projects. During the pre-construction phase Beacon assisted the project team

in developing a design to budget by identifying construction efficiencies, providing cost estimates, and suggesting alternative repairs or replacements and their life-cycle cost implications. Beacon's assistance was crucial for successfully coping with hidden conditions, unavailability of special materials and components, and the possibility that the design approach by the architect could alter the scope of the work. This task was facilitated by another similar renovation project that Beacon was undertaking on campus.

The renovation work was undertaken with a strict time frame for completion. Constrained site conditions, the abatement of hazardous materials such as asbestos and lead paint (to be performed in contained areas), the interdependence of demolition and structural work were some of the major challenges. These constraints, together with possible hidden conditions and a lengthy procurement of materials and parts (e.g. custom-made orders of wood-framed doors and dimensional stones), were approached with a careful project planning and phasing of construction activities in order to meet the tight deadline, 29 weeks from the start of the work.

Conclusions

Dioguardi appears to favour projects characterized by technical complexity that is addressed by its internal design/engineering resources. Beacon, differently, takes advantage of the organizational and delivery complexity of projects for deploying its management and coordination expertise, particularly in the case of multiple interfaced projects.

The analysis of the six projects shows that the firms have different capabilities.

Dioguardi's strong implementation focus relieves the chronic slowness of the Italian procurement system. With a preconceived set of procedural steps, i.e. approach to client, needs definition and solution proposal, the firm sets up a 'production' machine geared to deliver a quality product in a relatively short time (at least for Italian standards). Novel situations are handled with creativity by a young personnel eager to grow.

When and where needed, Dioguardi's local branches are supported in the initiation and execution of local projects, through the temporary transfer of personnel from the functional (estimating, purchasing and particularly design personnel) and production (e.g. construction workers) units of other branches. The mobility of key personnel is one of the reasons for the continuous success of operations.

The three analyzed projects probably would not have been

realized if Dioguardi had not been willing to risk upfront self-financed proposals, notwithstanding uncertain returns. This aggressive marketing attitude is nurtured by a solid financial situation and a systematic image-building approach.

At project inception and on short notice, Beacon develops a decision-making process for the client about the variables and constraints of the project delivery. This kind of logical roadmap reduces the information uncertainty that inhibits or lengthens the successful decision-making of the client, particularly in renovation projects. This capability is exercised in three steps:

- prompt collection of project data and development of possible options with their downstream implications in the project process;
- rapid analysis of the options and their implications, and iterative decision-making with the client;
- cooperative selection of the option and implementation plan.

The execution of these steps reflects:

- capability of marshalling internal and external resources at short notice—in this regard Beacon's centralization of functional resources (e.g. estimating, scheduling and construction planning) matches the geographic concentration of its projects;
- management and coordination capability broadly applied to all project phases;
- interpersonal skills for building the right 'chemistry' with the client and other project team parties as the basis for the successful definition of project priorities and constraints.

In terms of construction expertise, the firms are characterized by similar and unique features. Each firm shares a significant track record in projects such as underground garages, office and residential buildings, and complex renovations of historical buildings. Dioguardi, in addition, undertakes civil engineering work in the area of utility plants and transportation infrastructure. Beacon has construction expertise in hospital and research-oriented educational facilities, and renovation work in occupied space.

The following chapter discusses the importance of cooperation in international construction. Effective cooperation builds upon the complementary capabilities that result from the analysis of the above-described projects.

6 Cooperative strategies in international construction

This chapter discusses the new opportunities that result from the evolution of domestic and international markets. From the review of pertinent literature, several cooperative strategies for taking advantage of these opportunities are outlined. Alliances are useful for expanding the limited resources of medium-size firms, such as Dioguardi and Beacon, and for entering international markets. The chapter concludes by highlighting the typical challenges of international alliances, particularly those between European and US firms, and the criteria for their implementation.

Market trends and challenges

In highly developed economies—the context of Dioguardi's and Beacon's operations—the demand and supply of construction-related services have been characterized by the following main trends.

The growing organizational, technical and procedural complexity of projects requires the construction firm's active participation in all phases of a project, from its initiation to building operations. Limited resources, in addition, have caused government agencies to consider the use of non traditional procurement systems for public projects all over the world. Typical examples are the Building-Operate-Transfer agreement and the concept of privatization (Reinhardt, 1993; Worenklein, 1994). The expanded scope of services requires the development of new capabilities, such as access to financing, building coalitions, coordination of different services, and public responsiveness. The growth of construction firms toward full services capabilities cannot be achieved without corporate cultural changes, from simple execution orientation to value-added contribution to clients.

The clients' need for customized services or products is fostering the search for value-added features by firms, e.g. the understanding of which types of technical and management resources are necessary to create such a value for a client. Because firms can quickly develop the same technological

competence, competition is driven by creativity and speed in its application, and responsive project delivery plans that fit the variable needs of clients. In this scenario, organizational flexibility and cultural sensitivity are required for coordinating and integrating different roles and contributions by independent firms, and for developing products and processes that fit local cultures and procedures, particularly in the international arena.

The increasing community concerns about the sustainable prospects of the environment are creating needs that only collective participation and responsibility and social responsiveness can fulfill (Moavenzadeh, 1994). This need requires that firms develop cooperative attitudes with all sorts of organizations within and outside the construction industry, with a consequent shift from a production-only role to a more active social role. These attitudes are to be applied not only to new projects but also to the growing number of maintenance and repair projects that characterize highly developed economies in Europe and the USA (Bon, 1991).

Developments in information processing and communication technologies, e.g. Internet and 24-hour engineering (Anon, 1993a; Schriener and Angelo, 1995b), global procurement of human and physical resources, improved transportation infrastructures and the internationalization of financial markets allow firms to operate internationally. Because the demand and supply of construction-related services is no longer bound geographically, competition and opportunities for new projects will increase both domestically and internationally. International projects require a universal work culture and multinational teaming (Saleem Moini, 1993). The globalization of the market is changing the competitive strategies of construction and design/engineering firms (Seymour, 1987; Moavenzadeh and Sugimoto, 1991). Internationalization is also driven by the progressive shrinking construction markets of highly developed economies and the growing demand by less developed economies (Bon, 1992).

The above-described scenario seems to favor, on paper at least, large and integrated firms. Their often centralized operating procedures and bureaucratic cultures, however, may be at a disadvantage in meeting changing conditions and cultures, as well as needs for customized services around the world. New domestic and international markets, alternatively, can be accessed through networks of firms with complementary capabilities. Medium-size firms would find this organizational arrangement attractive, because it allows them to expand quickly and without stretching their limited resources.

Flexibility, decentralization, ability to redistribute functions and multiple communication channels will be the main assets of networks in meeting the dynamic and expanding needs of customers (Moavenzadeh, 1989a; Anon, 1993b).

Entering the international construction market

There are no precise data concerning the size of the international construction market. According to an *Engineering News-Record* survey, in 1994 the 225 top international contractors earned US$92.2 billion from projects outside their home market, approximately 19% of their overall revenues (Anon, 1995). Although large contractors have the lion's market share in the ENR ranking, the limited size of a firm does not preclude foreign operations, as approximately 28% of the ranked firms had less than US$200 million of combined foreign and domestic sales. The presence of many European firms (87 out of 225) in the 1994 ranking underlines their traditional international vocation, which is driven by the small size of their home markets and by incentives for profit from high-demand areas. A more significant European presence can be observed in the ENR 1994 international market survey of design/engineering firms (Reina and Tulacz, 1995). The corporate strategy of European firms is reflected also in the significant number of acquisitions of US concerns in the 1980s (Rice and Darnell, 1990; Moavenzadeh, 1991). Size of the market, immediate market share, timely entrance in growing regional markets, political and economic stability, ease of doing business, proven local management and know-how, and avoidance of local competition are some of the rationales behind foreign investments in US construction-related firms (Moavenzadeh, 1989b, 1991). Difficulty of integrating different corporate styles, cultures and operations (Schriener and Angelo, 1995a), undetected operational problems of the acquired firm, unreasonable expectations and failure to retain quality people (Rubin, 1987) are typical causes of unsuccessful acquisitions.

A firm entering a foreign market, in addition, can use three other mechanisms: opening a local office or subsidiary, working with a local firm on a project-by-project basis, e.g. through a joint venture, and forging an alliance, or a combination of these. Some of the European entries in the USA, for example, went through the progressive steps of a joint venture, purchase of a minority stake and full acquisition.

The establishment of a foreign branch office entails the long-term investment of developing in-house personnel, or hiring

high-caliber people familiar with local business procedures. It is commonly recognized that there is some lead time before a new branch can realize a profit in a new market. Lower than expected net profit margins (at least in relation to Europe), initial higher local subcontractor prices, slow organizational building and possible incompatibility among local and foreign personnel are typical challenges.

A joint venture is a one-time, short-term formal association between two or more firms that is generally developed for tactical purposes. Typical rationales of international joint ventures, particularly between a foreign and a local firm, are: political risk reduction, technology and know-how exchange or transfer (Anon, 1985; Sridharan, 1994), overcoming local government mandated trade barriers, increased joint reputation and liability limitation (Schriener and Angelo, 1995b).

In a typical joint venture with a local firm in the USA, the foreign firm generally provides working capital and bonding capacity or technical expertise not otherwise available. The disadvantages of joint ventures must also be considered (Seymour, 1987). There is the possibility of noncontractual performance by one of the partners (Cunningham and Hunter, 1988), of conflicts in joint project management (Sridharan, 1992), and the danger that a partner may use the newly gained knowledge to compete against the former partner (Hoffman, 1992), particularly in the case of know-how or technology transfer. The limited duration of a joint venture, in addition, may not be sufficient for developing full local expertise.

An alliance is a long-term cooperative agreement between firms with the purpose of meeting the mutual needs of the involved parties. This type of venture generally focuses on a wide range of improved corporate operations that cannot be easily achieved on the basis of individual pursuits. In an alliance, partners agree to share resources, technology, risks and rewards, and to offer mutual assistance (Badger and Mulligan, 1995). When the partners' contributions are complementary, quasi-vertical integration and synergies are obtained; when contributions are similar, cost or risk reduction considerations prevail, as in the case of a large project undertaken by firms with limited resources (Contractor and Lorange, 1988).

Commitment to reciprocal assistance and cooperation, understanding of and adjusting to partner culture and intentions, patience and open communication, and mutual satisfaction are the main features of a successful alliance. According to Hall (1995) a key alliance element is vulnerability: the option to withdraw from cooperating if the performance of a partner of the alliance as a whole is considered

unsatisfactory over time. This possibility motivates the partners to continuously manage their relationship in order to prevent the exercise of this option, particularly when mutual interdependence grows.

Alliances may take different forms, such as ongoing joint ventures with or without a separate subsidiary, partnering (Anon, 1991; Marini *et al.,* 1993; Reina and Rubin, 1996), know-how and patent licensing, management/marketing service agreements and consortia (Ecosfera, 1990). These cooperative forms differ in terms of risk/return tradeoffs and impact on the strategic operations of the firms. They also result in different levels of organizational interdependence, given the variability of committed resources, from the case of a simple reciprocal marketing assistance to that of a jointly owned subsidiary (Contractor and Lorange, 1988). The parties involved may be foreign and domestic contractors, private and public owners, design/engineering firms, subcontractors, suppliers, and financial institutions. Alliances may also be developed by direct competitors for defensive or offensive marketing purposes. In this last regard Impregilo, a major Italian construction firm, was initially established as a separate subsidiary of three firms with the sole purpose of competing in the international market against foreign firms.

Because alliances have long-term goals and results, procedural flexibility and continuous reconciliation of corporate cultures and informal relationships assume more importance than the blind observance of the venture terms. The latter, in fact, cannot foresee and provide for all the evolving conditions that surround the venture over time. At the same time, evolving cooperation needs to be negotiated within the framework established by the venture terms, so that deviations or benefits can be evaluated more objectively. In this last regard the goals of the venture, required resources and implementation schedules, and criteria used to measure progress toward goals need to be clearly stated and agreed upon. Continuous corporate support, open communication among participating executives and personnel, trust and patience are keys to the success of the venture.

Advantages of alliances

The formation of international alliances is a promising and flexible strategy for taking advantage of the opportunities and coping with the challenges created by the increasing globalization of the economy and the growing intensity of competition. Medium-sized firms with complementary

capabilities can integrate vertically along the functional phases of the building process or horizontally across a single functional phase. The synergetic nature of complementary efforts, in addition, facilitates the organizational growth of each firm. According to a Construction Industry Institute (CII) publication (Anon, 1993b), the benefits of international alliances can be classified according to three business aspects: marketing, organization and project execution capabilities.

Marketing capabilities

Alliances give access to local markets or distribution channels at lower costs. Improved knowledge of local culture, technology, regulations and market conditions is critical for shortening learning curves in initiating international projects.

Alliances allow a firm to retain clients who operate beyond its traditional geographic markets or to obtain work from new clients procured by an allied firm in a foreign country.

The complementary capabilities of allied firms increase the competitiveness and pre-qualification chances of the venture, and enhance the local reputation of each firm. The alliance with a local firm circumvents local government trade barriers.

Organizational capabilities

Alliances expand the scope of services offered by firms by diversifying service and product portfolios. The access to outside technology or expertise not available in-house allows firms to undertake projects that otherwise would not have been considered.

Alliances broaden the cultural and technical background of personnel directly involved in the venture and, at the same time, the sharing of resources required in joint projects increases organizational flexibility and may lead to possible beneficial synergies.

By building upon trust and common goals, alliances increase organizational efficiency by requiring fewer resources in the planning and coordination of multiple contract projects.

Project execution capabilities

Through sharing of risks and increased capital and bonding capacity, alliances allow firms to engage in larger projects and enter unfamiliar markets.

Economies of scale and/or rationalization of production may be achieved through the larger purchasing volume of the venture, and using the proper comparative advantage of each firm during the execution of projects.

Superior knowledge of the local market, construction procedures and technologies together with the concurrent application of diverse specialized resources by each firm shorten the execution of projects.

Given the long-term nature of an alliance, the importance of the above-mentioned rationales may shift over time, with consequent impact on the motivation of partners and the viability of the venture. According to Contractor and Lorange (1988, p. 25), the erosion may result from external or internal sources. Changes in the industry may induce the obsolescence of the exchanged technology. 'One partner learns from the other, and the other partner has nothing new to offer,' with consequent shifting of the relative bargaining power of the partners.

Challenges of alliances

International alliances are a growing requirement for competing in the global market successfully. Their development builds upon the successful understanding and reconciliation of the different corporate cultures, paradigm and environment of each party. In a typical European-US venture, the following factors, among others, should be considered, according to a CII report on international alliances (Badger *et al.,* 1993):

Market characteristics

Europe has a fragmented and localized construction market. Geographic diversification is more challenging than in the US territory, because culture and negotiation style, project organization, construction practice and standards, bidding requirements and award criteria, interpretation of contractual terms and roles, among other factors, differ from country to country (Kramer, 1982; Ecosfera, 1990; Spencer Chapman and Grandjean, 1991; Cooke and Walker, 1994; Atkinson, 1995). Although more homogeneous, the US market varies according to regional economic booms and recessions, and growing or declining growth opportunities for each type of project. At the same time, few firms operate at the national level. A foreign firm, therefore, faces the challenge of combining the location of its local partner and the choice of a market segment.

Business attitudes

The US leadership in economic and technological development has convinced many firms that US methods are logical and work well:

> Americans have a natural inward business philosophy that leads to ethnocentric behavior, and economic conditions have played a role in maintaining that. (Altany, 1989, p. 14)

A typical example of this philosophy can be found in the opponents of metrication efforts in the USA. For these reasons, US firms may be less inclined to change their business attitudes or adjust to local cultures when they enter an international alliance. Export-oriented European companies, on the contrary, are more used to cultural differences and cooperative undertakings, even among direct competitors. Typical examples are the cooperative movement in Italy and the *paternariat* in France (Piore and Sabel, 1984) and cooperative construction R&D programs in Sweden (Bröchner and Grandison, 1992) and at the European Union level.

Short-term/long-term expectations

European enterprises have been characterized traditionally by longer-term commitments. The investment decisions of US enterprises tend to be more influenced by short-term results. In southern Europe, business and bureaucratic transactions take longer than those in the USA. This aspect can be irritating to fast-paced North Americans.

Dependence on formal/informal documentation

Business relationships in Europe often build upon human relationships and trust. Informality and general understanding add flexibility in dealing with venture contingencies. In Italy, for example, business is often developed from personal relationships. In the USA human relationships may develop from doing business first. The US approach, in addition, tends toward a legalistic and cumbersome contract language to venture agreements that may stifle openness and cooperation.

Delegation of authority

European managers generally receive more autonomy and responsibility in international operations. US firms often

restrict their overseas managers' authority. This factor may slow down joint decision-making processes and increase coordination costs.

Although not specifically related to construction and Europe-US alliances, the literature reviewed shows that lack of cross-cultural management efforts (Lane and Beamish, 1990; Hall, 1995), short-term expectation versus long-term plans (Bruce, 1990), conflicts in sharing power and decision-making (Contractor and Lorange, 1988), lack of planning (Devlin and Bleackly, 1988), and changing political climate and market environment surrounding the association are major components in the failure of an alliance.

Implementing an alliance

There are no precise rules for developing an alliance in international construction, although mutual satisfaction is the main objective. The above-mentioned CII report (Badger *et al.*, 1993) proposes an implementation model and addresses the characteristics of a well-structured alliance. The proposed criteria and issues resulted from extensive interviews with very large European, Japanese and US construction companies that operate internationally and have resources that largely exceed those of medium-sized firms such as Dioguardi and Beacon. The report, for example, quotes a development cost estimate of an alliance in the range of US$600000 per year. Typically, between 18 and 24 months are spent in sharing information and in understanding the nature of the alliance before the beginning of active involvement. The implementation model consists of six steps:

- Define the alliance and how it will differ from standard business practice such as a joint venture or a partnership.
- Develop goals and mission, e.g. technology or geographic objectives or other competitive improvements.
- Identify challenges and obstacles, such as contribution requirements, corporate support, risk assessment and quantification, the need for changing corporate paradigms and the selection of proper agreement.
- Define measurement criteria, cost estimate and implementation schedules.
- Identify responsibilities for the management of the alliance.
- Implement continuous evolution and improvement.

According to the report, a well-structured alliance includes a set of characteristics, whose absence reduces the probability of success:

- The alliance produces a comfortable atmosphere built on trust. The partners should feel comfortable with the fairness of the relationship.
- The purpose of the alliance is clear. Continuous efforts should be made to clarify goals and understand partners' expectations.
- A cooperative spirit exists among alliance partners. Organizational orientation, ad hoc managerial expertise and cooperative personalities are needed for developing cooperative relationships. Discontinuity of personnel may break down the alliance.
- The risks are identified and affordable. The reduction of risk is a key factor in any alliance.
- The alliance complements the strengths of each partner. Successful alliances build upon the synergies of the combined strengths of the partners.

Cooperation between construction firms is fostered by the changing nature of demand, clients' perception of the role of the industry, and growing competition both domestically and internationally. Cooperative strategies represent a mode of international business operations that is different from the traditional 'going it alone' of multinational enterprises. This new business approach entails an expanded range of managerial skills, from monoculturalism and individual control of few objectives to multiculturalism and shared control of multiple objectives. The next chapter discusses the ongoing cooperation between Beacon and Dioguardi, and highlights the challenges of its implementation.

7 The alliance between Dioguardi and Beacon

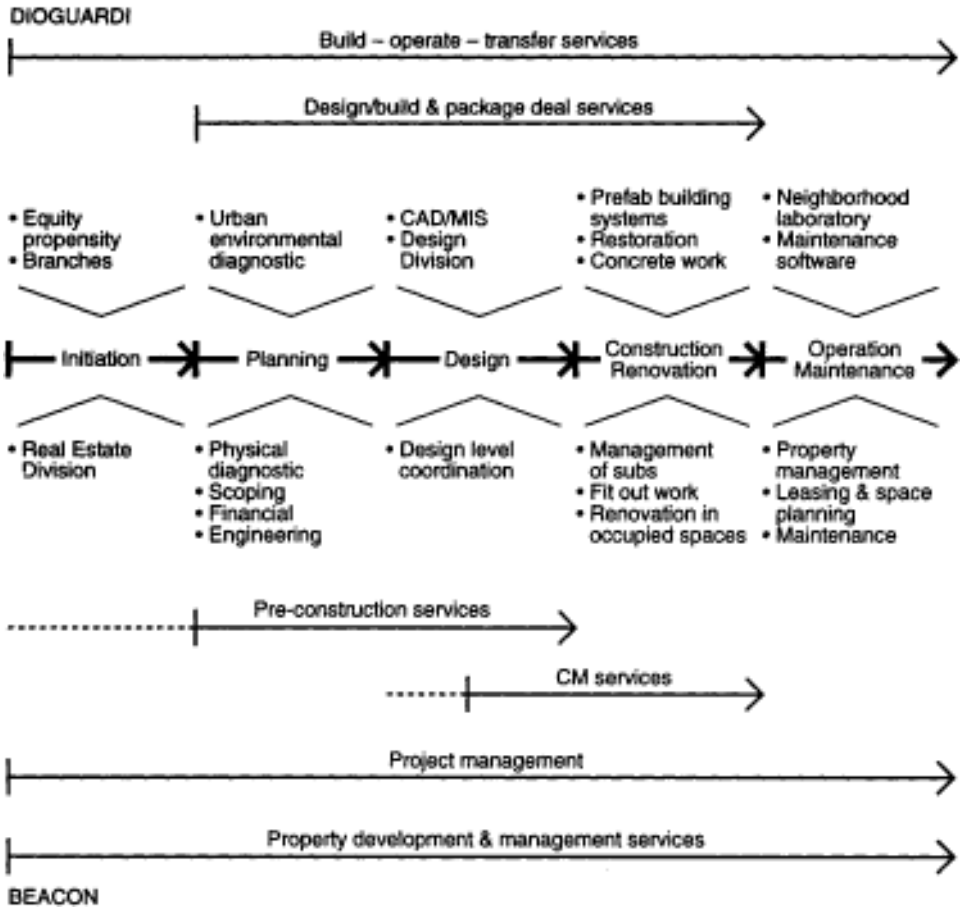
The ongoing association between the two firms is currently in its fifth year. As in any successful relationship, it has gone through periods of ups and downs. The long-term efforts have finally paid off with the first joint project: the construction of the new Italian Chancery in Washington, DC. Like the first child of a young family, the project has increased reciprocal satisfaction and commitment. In retrospect, the building of the association between Dioguardi and Beacon has not been characterized by the systematic and prescriptive approach suggested by the CII report (Badger *et al.,* 1993). Its progress can be seen as a series of efforts that are driven more by cooperative spirit and adjustments to changing environmental situations than by the faithful observance of an initial plan. If the pattern of activities and adjustments is analyzed, the following logical steps emerge:

1 Define objectives and needs.
2 Find a compatible and complementary partner.
3 Define common objectives.
4 Understand and plan for cultural differences.
5 Reach an agreement.
6 Manage the ongoing cooperation.
7 Improve cooperation by learning from experience.

This chapter discusses the issues that need to be considered in the implementation of these steps, namely the complementarities and common objectives of the firms, the cultural challenges faced by the alliance, the chronology of its major events, and the lessons learned from this experience.

The complementary capabilities of the firms

The objective of any alliance is to improve the competitiveness of each firm, both locally and internationally. Its development should be based upon the integration of the complementary strengths of each partner. Figure 7.1 shows the main capabilities of both firms along the value-added chain of the building delivery process.



7.1
Dioguardi's and Beacon's complementary capabilities along the building delivery process.

Their joint capabilities span the full spectrum of expertise applied to the process. Although both firms have a reputation for construction quality, Beacon's expertise seems particularly to fit the requirements of the pre-construction and post-construction phases of a project. Dioguardi's strong delivery focus positions its capabilities in the design, engineering and construction phases of a project. Common capabilities, which are omitted in Figure 7.1, are found in the design and construction phases of the delivery process. Both firms share a long-standing cooperation with leading architects. Expertise in the construction of underground garages, of complex renovations and restoration of historical buildings is a typical common feature. Following is a brief description of the complementary capabilities of the firms.

Initiation

Dioguardi induces demand by offering promotional services to clients, self-financed design proposals and maintenance services, as in the case of the airport terminal and garage projects. The firm, in addition, creates demand for construction services through equity participation in projects, as in the case of the Margherita Theater project. Beacon has a strong market-oriented management, which is complemented by the project development expertise of its sister company, TBC. Part of its market is created through Beacon's assistance to owners or architects during the scope definition of a project, as in the case of the clinic center in Boston.

Planning

Dioguardi has expertise in implementing social, cultural and physical assessment studies of the built environment, as is reflected in the urban renewal initiatives conducted with the Neighborhood Laboratory. The MIT and Harvard projects reflect Beacon's trademark capabilities in formal feasibility studies and scoping of projects that involve renovation or new construction. Beacon's financial engineering expertise is one of the firm's contributions to Dioguardi's Margherita project and to the feasibility analysis of the renovation of an old monastery.

Design

Through its design division and the support of key architects, Dioguardi engages directly in design development, in order to create construction project opportunities. The design division, in addition, engineers a construction process that enhances the firm's technical and production capabilities. Beacon's long experience with fast-tracked projects endows the firm with the cooperation and coordination capabilities of firms engaged in the design process. This skill is a major requirement in complex projects with multiple design contributions.

Construction/renovation

With its in-house specialized workforce, Dioguardi excels in concrete and masonry work. Production of precast components and CAD capabilities applied to construction planning enhance cost efficiencies. The firm also has expertise in the architectural restoration of historical urban blocks, as documented in the

initiatives with the Neighborhood Laboratory. Beacon's capabilities focus on the management of subcontractors. This expertise successfully copes with the increasing fragmentation of construction activities, and is essential in the management of international projects. Beacon also specializes in fit-out operations and renovation of occupied spaces, as documented by many projects of office buildings. The transfer of this expertise, i.e. fit-out components and related assembly techniques, to the Italian context would be useful, given the persistent craft nature of many Italian interior construction operations.

Operation/maintenance

Dioguardi develops customized software for maintenance programs, building on their capability to collect and interpret data about customers' needs. Beacon's continuous involvement with the large building portfolio of its sister company has given the firm expertise in space planning, leasing, energy-saving programs and maintenance services.

Management and organizational capabilities

Dioguardi's capabilities are enhanced in the implementation phase of the project, as reflected in its design/build operations and package deals through its line of prefabricated building systems. The physical mobility of its key personnel and the wide geographic distribution of its branches allow Dioguardi to operate internationally, as shown in its initiatives in Eastern Europe. Beacon is a process-management-oriented firm. Its capabilities are enhanced in the planning and management of multiphased and multi-interfaced projects and the development of multiyear construction programs for clients. This expertise is particularly valuable in Europe, whose construction industry still lags behind that in the USA in terms of construction management techniques.

The combination of the above-described resources leads to synergies and overall improved capabilities, and to enhanced qualification of the firms involved in the cooperative venture. Expanded capabilities increase output value or reduce input costs. Beacon's experience with feasibility studies, project scope definition and financial engineering expands upstream the joint capability to offer value to customers, particularly in the case of turnkey or building-operate-transfer projects. In terms of cost reduction, Dioguardi's design division has the capacity to engineer a construction process that enhances its production capabilities. The in-house precast plant and the patent rights

of several prefabricated building systems are an additional possible source of cost reduction.

Cultural responsiveness and social participation, a long-standing relationship with leading architects, a client-oriented service culture, an attitude to customized services, a successful record in all phases of the building process, and professionalized human resources are some of the attributes that enhance the qualification and sophistication of the venture and, consequently, the marketing, acquisition and execution capabilities of new projects.

The opportunities for collaboration

If we relate the complementary capabilities of Beacon and Dioguardi to the market trends that are described in Chapter 6, several opportunities result from the alliance of the two firms, particularly in regard to joint or individual undertakings and reciprocal organizational growth. These opportunities are facilitated, among other factors, by the possibility of operating internationally, by the expanded scope of services, increased capabilities and the high marketing profile of the alliance. The thrust toward the realization of these opportunities encompasses different time horizons and varying degrees of capital and human resource commitments. Following is a description of some of these opportunities ranked according to required development time and resources and inter-organizational interdependence. The realization of each opportunity, in addition, has a different strategic impact on the firms, depending on the number of corporate resources and operations directly affected by the initiative.

Reciprocal assistance in the undertaking of individual projects and marketing of products and services

Beacon can help Dioguardi in exporting its line of building systems in the USA or in applying the successful experience of the Neighborhood Laboratory process to the growing problems of the American inner cities or complex urban renewal projects. At the same time, Dioguardi can assist Beacon in exporting capabilities such as program and construction management, financial engineering, space planning and leasing and property management. Some of these capabilities have already been applied to several of Dioguardi's projects, and it is not difficult to forecast their offer to third European parties, considering the relatively lower level of sophistication of many European construction firms in these matters. Although initially the

cooperation between the two firms may take the form of simple reciprocal assistance to individual pursuits, the evolution of these initiatives may lead to joint projects.

Servicing clients that operate internationally

This opportunity applies, for example, to US corporations that operate in Europe and vice versa. Hospitality (hotels and restaurants), service and manufacturing (factories, warehouses and offices) companies, cultural institutions (museums, offices and temporary exhibition pavilions), and international and diplomatic organizations (offices, embassies and related facilities) are typical clients. The latter can be offered full services, from the preliminary feasibility and planning, through design and construction, to the operation and maintenance of the realized facility. In addition, it can offer value-added features such as shorter project delivery, use of proper local technologies, cultural responsiveness and overall lower coordination costs. These services are particularly important to those corporations that have lost their internal construction engineering departments during the wave of corporate downsizing in the past few years. In a typical project that involves an US client who wants a new facility in Europe, after the feasibility study performed by Beacon, Dioguardi would assist the client in the selection of the site and monitor the design process, possibly developed in the USA, in order to incorporate local technology and construction practice. Construction may be performed jointly, also to facilitate Beacon's learning curve in the European market. After the completion, Dioguardi would be in charge of the operation and maintenance of the facility. The joint capabilities of the firms particularly fit the requirements of new construction or renovation projects characterized by organizational, procedural and technological complexity.

Developing joint self-promoted projects

The problems of European and US inner cities, the needs of the aging population in both Europe and the USA, the parking problems of major European cities, particularly in Italy, and the relative underdevelopment of the service-oriented building infrastructure of Eastern Europe may represent the target of new joint initiatives. The development of these initiatives requires long-term planning characterized by initiative and learning, a marketing focus on 'seeds' rather than 'needs,' and joint equity participation. Shrinking economic resources are inducing public

authorities to consider new options in financing and operating public projects, as well as in organizing their delivery process. In a typical public/private arrangement, the venture can capitalize on Beacon's expertise in financial engineering and space leasing at the initial phase of a project. The profile of the initiative could be enhanced by deploying Dioguardi's Neighborhood Laboratory, in the case of an urban renovation project, and/or the contribution of leading architects with whom both firms have long-standing relationships. Design and construction could be managed by either firm, because of their experience in the initiatives mentioned earlier: that is, urban renewal, residential, underground parking garage, hotel and office projects. In these phases, the choice of the leading role will depend on the location of the project and economies in the use of human resources. The management of the realized facility would take advantage of Beacon's expertise in property management.

Improving organizational effectiveness

Mutual collaboration also offers the possibility of enhancing the long-term effectiveness of human resources and internal operations of the firms, besides the direct advantages of joint projects. In this regard, there are several opportunities to be considered by exchanging or trading the know-how that is embodied in the personnel, organizational procedures or technologies of the firms. Beacon could seek the assistance of Dioguardi's design division in enhancing its construction capabilities through ad hoc engineered processes. Dioguardi's assistance to Beacon in the development of CAD capabilities, in addition, would add competitiveness to its pre-construction services, such as value engineering or construction planning. The study of Dioguardi's established MIS would be helpful in improving Beacon's productivity by automating data collection and retrieval and electronically linking operations such as project planning, budgeting and cost accounting. The use of Beacon's expertise in project planning, conversely, would be beneficial in many projects initiated by Dioguardi. Beacon could assist Dioguardi's management personnel in improving their expertise in project scope definition, leasing requirements and economic feasibility studies. Lastly, Beacon's experience with property management could be the resource for training the personnel of Dioguardi's new maintenance division.

All these initiatives put emphasis on the development of human resources, the main source of comparative advantage among construction firms. These opportunities are already a reality, given the ongoing collaboration between the firms. The

exchange of know-how and personnel undoubtedly goes beyond the issue of organizational or production improvements, because it forms the basis for developing reciprocal trust and commitment, and, ultimately, shared vision. These are the prerequisites for an effective collaboration and the success of possible joint undertakings.

The cultural challenges for the two firms

Cultural differences may create confusion and misunderstanding in the management process of an alliance, particularly an international one where corporate differences are augmented by national customs and styles. The relationship between the two firms has not been exempt from this problem. The understanding and management of these differences is the key to a sound relationship. The following notes outline the different cultures of the two firms and their respective national business environments.

Dioguardi and Beacon have different approaches to competition. The former creates opportunities for new jobs, and the latter takes advantage of available opportunities. Promotional investments, consequently, may not fit Beacon's focus on the bottom line. Dioguardi's organizational culture, based on authority delegation and people orientation, does not fit Beacon's centralization and task orientation. This last difference may create problems in decision-making and the unbalanced staffing of the alliance. The average Dioguardi manager has more autonomy than his/her Beacon counterpart, who needs to consult continuously with superiors. The task orientation of Beacon managers does not provide an incentive for the socialization process and long-term commitment that is required in an alliance. While the majority of Dioguardi managers speak and understand at least some English, the knowledge of the Italian language is very limited at Beacon. The diffusion of cooperative culture is easier in Dioguardi than in Beacon. The US firm's success is driven by the individual achievement of personnel, while the Italian firm emphasizes the personnel responsibilities toward overall organizational effectiveness and growth. Beacon's personnel, therefore, may be inclined to pursue individual projects with short-term and measurable results rather than joint undertakings with long-term results. The cultures of the Italian and US firms, in addition, have been shaped by different environments in terms of attitudes to cooperation and propensity to litigation.

After centuries of foreign domination, Italians have developed a sense of resilience and flexibility to contingencies. The decision-

making process, consequently, is influenced more by a particular situation than by a predetermined set of ideologies and rules. Italy has one of the largest bodies of law in Europe (the French, fathers of the civil code, pale in comparison). Complex and contradictory provisions, and the Italian atavistic resistance to collective discipline, hinder the systematic enforcement of their laws. This climate is reflected in the administration of contractual agreements of public projects, where flexibility in the enforcement of clauses and back-room negotiation may occur. Subjectivism and feelings are often more important than factual analysis during a negotiation process. Personal relationships *(l'amico)* and connections *(la cordata)* are generally as important as price or merit in business deals and career advancement. Urban life and the Italian extroverted nature facilitate socialization. A welfare-oriented political system, restrictive labor laws and the existence of many state-owned enterprises ensure long-term employment, protect workers' rights and hinder job mobility.

A belief in individual values and initiatives permeates the US culture. A strong sense of what is right and wrong drives behavior and nurtures self-confidence. International pre-dominance and the continental scope of the local market have produced an inward business culture, less prone to look at the outside world. Decision-making is straightforward and less flexible in compromising. In a negotiation process, issues put on the table are based more on factual analysis than on intuition and feelings. Business communications tend to be direct, even when the message is negative. Individual initiative and decisiveness are prized characteristics in a managerial career. A strong work ethic, suburban life and privacy hinder socialization. Friendship is cherished but restricted to few. Emphasis on material progress, specialization and continuous rationalization of work processes, such as corporate downsizing, makes a person a replaceable unit in any organization. Short-term employment is balanced by job mobility, both outside and inside the same firm. This last aspect may hinder continuity in an international alliance.

Chronology of the alliance

The genesis of the association between Dioguardi and Beacon can be traced to the early 1980s. As a university professor, Dioguardi's managing director had continuous contacts with American academia through cultural visits, symposia and publications in the 1980s. His first contact with Beacon's president, at that time a professor at MIT, was of an academic nature. This was also the time when the establishment of a Dioguardi branch

on the West Coast of the USA was considered through the contacts with a faculty member at Stanford University. Beacon's international orientation is more recent. It was mainly driven by New England's deep economic recession of the early 1990s and the concurrent acquisition of an executive with ongoing ties with European construction companies and academic interests, who ultimately became the champion of the alliance. The fall of the Berlin Wall had opened opportunities for real estate initiatives and possibly construction projects in eastern Europe. The western European market was also strong. The new executive was put in charge of a low-budget search project for European links and opportunities, given the economic impossibility of opening a local branch. In October 1991 during a business trip to Moscow, with a two-day stopover in Italy, the conceptual basis of the alliance was developed and agreed upon with Dioguardi's managing director. The agreement (see the Appendix) focused on five broad objectives: establishing a local presence, marketing the joint or individual capabilities of the firms, reciprocal consulting on management and technical matters, transfer of know-how and technology, and joint projects.

Three attributes characterized the cooperation envisioned in the document:

- Partners exchange or provide resources on a continuing basis according to established criteria and costs.
- Responsibility for managing the venture is equally shared by the partners.
- The partners maintain their own independence by having many activities not included in the agreement.

The initial duration of the agreement was one year, with successive three-year renewal periods. The draft was negotiated in two visits to the USA by Dioguardi's strategic consultant in the fall of 1991, and finally signed in January 1992. The remainder of the year was spent in evaluating the two firms, exploring specific opportunities for reciprocal assistance and joint initiatives, according to the general intents of the agreement. Typical activities of this period were:

- the exchange and analysis of a voluminous documentation of the firms' capabilities and visits for understanding their operations;
- Beacon's study of the Binistar system with regard to US competition, type of market niches, customer orientation and promotional contacts with potential clients in Boston, Chicago and Atlanta;

- joint proposal for a training center at the Moscow airport for a major American airline; study of a joint project in Prague, the conversion of a historic building into a hotel;
- the search for opportunities for reciprocal consulting or involvement in the projects currently undertaken by the firms. Ultimately Dioguardi's Margherita Theater project and Beacon's New England Holocaust Memorial and Beth Israel Hospital resulted as the most beneficial involvement.

The end of the year 1992 and the beginning of 1993 was also the occasion for strengthening corporate support for the alliance through additional reciprocal visits. Beacon's president was impressed by the sophistication of the Italian firm's operations and its consultants, e.g. Renzo Piano, and the warm hospitality. During the subsequent visit to Boston, Dioguardi's managing director was hosted in a suite of the Rowes Wharf Hotel, an award-winning landmark developed and constructed by Beacon. An antique plane was offered as a gift. A meeting with Beacon's founder resulted in the discovery of mutual interests in collecting old maps. Socialization and gracious behavior may not seem influential for the sake of an alliance. These intangibles, however, are useful in developing a comfortable atmosphere and a positive feeling among partners.

The year 1993 was characterized by the implementation of a significant number of initiatives that had been planned the previous year:

- *Reciprocal consulting*. Joint workshops in Boston and Bari were held to study the financial engineering, leasing and operational aspects of the Margherita Theater project. A Dioguardi project designer was involved in the constructability analysis of the New England Holocaust Memorial and critically reviewed the economic feasibility of the foundation system of the Beth Israel Hospital project.
- *Marketing*. Local pricing of the Binistar and Arclatum systems was finalized with the visit of EGECON's managing director. Possibilities for joint projects were discussed. The alliance was advertised through conferences, press releases and other publications.
- *Joint initiatives*. Major US multinationals planning to expand their operations in Europe were targeted and contacted. A joint proposal for a program of European retail centers for a computer company was developed.

Besides possible long-term direct benefits, these initiatives resulted in a better understanding of the firms' operations in

their home countries and the validation of their capabilities. Joint initiatives and exchange of personnel, in addition, were beneficial for the professional development of involved personnel, and diffused awareness of the ongoing cooperation. The momentum built in 1993 dropped significantly in the following 18 months until the spring of 1995. Contacts and cooperative initiatives were kept to a minimum. During this period, external environmental factors strongly affected the progress of the alliance.

Economic recession, political uncertainty and lack of public projects, the traditional engine of the Italian construction industry, shifted Dioguardi's efforts towards the French and, particularly, German markets to compensate for depressed domestic sales. The reorientation was also characterized by organizational adjustments with the transfer of personnel and construction workers from domestic to foreign branches. The US multinationals at the same time had postponed their European plans, waiting for a future recovery in the economy.

Beacon, at the same time, was concentrating its efforts on the rebounding local market and experiencing its transformation from a family-owned to a public company. This change affected the entire Beacon group, particularly in terms of focus on profitability and expense accountability. A particularly important event was the transfer of the alliance's champion to a more senior position in the property management division of the group. Although the executive kept his commitment to the alliance, his transfer did not have a positive psychological impact on the Italian partner. The situation did not improve either in the spring of 1995, when Dioguardi was awarded a job for a US corporation in Milan, following a lead of Beacon and a joint cost analysis study. Momentum picked up again in the remaining part of 1995, because of the incoming pre-qualification deadline for the competitive bidding of the new Italian Chancery in Washington. In the fall of 1995, a marketing manager from Dioguardi spent several weeks in Boston to develop a bidding strategy with Beacon. A 60/40% joint venture was formed with Beacon as a leader of the team and the opening of a Washington representative office. A successful compromise was achieved between the companies' different approaches to the job: Dioguardi's propensity to absorb market entrance costs and any possible promotional efforts in the bid and Beacon's cautionary focus on the project's profitability. After the award of the project to Beacon and Dioguardi, a very positive feature was the joint planning and purchasing activities that precede the start of a construction project. Personnel interaction and

socialization, particularly between the above-mentioned marketing manager and a Beacon executive during the estimating and purchasing phases of the project, have facilitated the further diffusion of the alliance culture within the various organizational levels of the firms.

The history of the alliance, in conclusion, has evolved according to three main periods. The first focuses on the study and validation of the firms' capabilities; the second is characterized by reciprocal assistance and planning of joint initiatives; and in the third, momentum is picking up again after a slowdown for external and internal factors.

Learning from experience

The implementation of an alliance is like the development of any human experience. We grow by learning from our mistakes and achievements. Following are some of the factors that strongly influenced the performance of the relationship to date and the advice of a key US participant.

Championing the alliance

An alliance needs a champion on both sides. The champion is an internationally experienced manager who initiates, develops and maintains the relationship, even when other personnel are added after the final development of the venture. His/her personality traits should be conducive to a cooperative atmosphere and include sensitivity to the impact of culture on behavior, patience and adaptability to changing situations, openness in discussing problems without reservation, ability to develop joint opportunities and team building, and the subordination of personal interests to the advancement of the alliance. These missionary qualities cannot be easily taught; they are natural traits. 'Commitment is probably the most critical factor,' states Beacon's champion, who still maintains a sense of duty to the venture and partner since his move to another division of the group. His advice to those who want to develop a European-US alliance is the following (Irwig, 1993):

- Take a long-term view. Do not expect immediate results.
- Ensure firm compatibility. Work hard to reduce potential misunderstandings resulting from cultural and language barriers.
- Maintain continuous contact. Be responsive, even if it requires a 4 a.m. telephone conversation.

- Share expertise openly. Progressively involve company personnel in providing expertise and advice.
- Seek joint opportunities aggressively. Develop leads and follow through systematically.
- Review progress periodically. Principals should meet formally at least once a year to review costs and benefits.
- Understand the evolving political, social and economic environments at a global level, and work with them.

Understanding and managing cultural differences

An international alliance faces national and corporate cultural differences. National values and beliefs cannot be changed, and should be understood and accepted for what they are. Corporate culture can be detected in the actions and behavior of partners by analyzing their internal operations and mutual interaction. The experience of the alliance shows that the understanding of corporate cultures is the prerequisite for minimizing the misinterpretation of each partner's intentions. Behavior often is driven more by national or corporate cultures than by a hidden agenda. A hypothetical situation is the signature of the contract for a joint construction project. The US firm would spend much time in analyzing the clauses and forecasting all possible risk scenarios, because it operates in a very litigious environment with a strict enforcement of contractual clauses. The Italian firm would sign the contract without much hesitation, simply because it is used to a more lenient environment regarding contractual enforcement in its country. The Italian firm, at the same time, would interpret the long decision-making by the US firm as a stalling tactic. In the observed alliance, misinterpretations of behavior occurred, notwithstanding the efforts of the partners to understand each other, giving rise to interlocking situations that needed the intervention of an outside and independent facilitator, an individual well versed in both cultures. The cultural mediator needs to have interpretative skill and exercise a proactive approach to the management of the alliance to avoid misperception of intentions. For these reasons, he is continuously kept abreast of the activities of the alliance. His role, however, is only a supplemental one. There is no substitute for culturally appropriate behavior in face-to-face interaction.

Corporate support and commitment

The successful development of an alliance is subordinated to corporate support and long-term commitment. The top management of each firm must understand the need for a shared

vision of the alliance's purpose and meaning. Signing an agreement is not enough for developing a common vision. In the observed experience, the top management bought into the alliance by being directly involved in the negotiation and modification of the draft agreement prepared by Beacon's champion.

Corporate support is also needed for overcoming organizational resistance. The described alliance is not yet a self-sufficient entity, and draws resources from the various business units of each firm. 'Turf' issues and misperceptions may hinder the commitment of these units, as was noted in some marketing initiatives of the venture. In this case, the top management's effort has been important in ensuring attitude adjustment by all personnel, through early communication of alliance objectives and orientation.

Maintaining continuous commitment is even more challenging. Changing environmental conditions, both external and internal to firms, may shift top management's attention and ultimately deter continuity in the alliance. External factors can be seen in the changing local market conditions of the firms during the progress of the alliance, with a consequent shift of corporate needs and orientation. Internal reorganization may hinder the cooperation continuity among the alliance's key people. The move of Beacon's champion to another division of the group was not interpreted as a positive sign by the Italian partner. It is no coincidence, in fact, that his move was followed by a period of minimal contacts.

Trust

An alliance is empowered more by the behavior of each partner and the relationship as a whole than by the blind compliance with the agreement. In a relationship trust builds upon past experience and is projected toward the future. Developing and maintaining the confidence of all participants is difficult, because it requires time and human resource commitments. In this regard, the US top management faces the challenge of justifying investments with no prospect of short-term monetary results, contrary to the traditional local business paradigm. In the observed progress of the alliance, the partners' control and balance of interdependence shifted according to contingent situations and created conflicts. The reliance of partner A on partner B's correct behavior reaches an apex when A has minimum control over B's behavior. The relationship suffers if B's actions do not meet A's expectations and B is not aware of A's displeasure. The matter may be perceived as one of minor importance, but negative feelings continue to build up, if the

issue is not addressed and solved through open communication and candidness.

Coordination and communication

The negotiation, planning and execution of a joint project present unique organizational challenges. A typical situation is represented by a project for an Italian client to be constructed in the USA and therefore subjected to local contractual and administrative procedures. During the negotiation phase in Italy, both the Italian partner and client may not be fully aware of the legal and procedural implications of the US contract. Assumptions may not reflect those of the US partner. During contract execution, different accounting procedures and criteria with which costs are charged and allocated in the job give rise to misunderstandings and lengthy explanations. Being used to the limited number of contractual responsibilities and informal administrative procedures, the client is annoyed by the amount of paperwork to be processed and the formality of the correspondence by the US counterpart. These are a few of the issues whose successful solution needs proactive coordination and continuous communication and surveillance.

To date, the building of the alliance has cost a small fraction of the amount estimated in the CII report (Badger *et al.*, 1993), but it has required a considerable amount of personal commitment and efforts that, after all, are the basis of many friendships.

The future of the alliance

The corporate history of Dioguardi and Beacon to a large extent parallels the evolving features of competition in the construction industry: from production to full services orientation, from simple to complex project management, from localized to geographically dispersed operations. Although culturally different, the firms have a common denominator in terms of sophistication, quality service to clients and proactive approach to construction business evolution. The firms are aware that their environment has been and will keep changing with further segmentation of the markets, need for new capabilities and local competition by global contractors. This scenario favors large integrated firms and specialized small firms acting as subcontractors, and squeezes the prospects of medium-sized firms. Retrenching into niche and local markets may not be enough for survival and growth, because of the possible entrance

of new competitors and changes in local markets. Opportunities and threats can be tackled through cooperative arrangements. Alliances offer a wider range of strategic flexibility than a single firm would have on its own, particularly in terms of joint increased capabilities and synergies, and geographic diversification by market segments. Contrary to conventional wisdom, the experience of Dioguardi and Beacon shows that international alliances between firms with limited resources are feasible and can be successful. Propensity to continuous learning, cooperative spirit, time and human resources commitment, and a good dose of optimism for the future are the driving factors of their alliance. Both companies are aware that the venture has not capitalized yet on their combined resources. After all, the first joint project was obtained through competitive bidding, not the best and only vehicle for taking advantage of the strategic alliance. This major project, nevertheless, represents a psychological boost for a continuous mutual commitment. Building upon the growth plan of Beacon, the companies are currently exploring alternative options: joint projects in other US, regional or European markets, the opening of a jointly owned branch in the USA, and the further development of the firms' existing ones.

Appendix The international bridgehead agreement

Fratelli Dioguardi
Beacon Construction Company
January 1992

PURPOSE:

The intention of this Agreement is to enhance the competitiveness and the profitability of each firm in its own country and to expand business opportunities for both firms internationally.

Both firms hereby agree to collaborate, to the greatest extent possible, in the achievement of this objective.

LOCAL PRESENCE:

Each firm will display its name and/or logo in the home office or other major, permanent location of the other firm in a prominent position visible to all visitors. In addition, each firm will be entitled to identify, on their letterheads and on other stationery and literature, their presence in the location of the other firm. Both firms will make arrangements to appropriately receive and transmit all calls and messages received.

MARKETING:

Both firms will endeavor to find and develop business opportunities which capitalize on the joint capabilities of the two firms. In addition, each firm will assist the other in developing contacts with local firms, developing projects in the home country of the other, irrespective of whether or not this leads to an opportunity for a joint venture.

Both firms undertake to publicize their collaboration to the fullest extent practicable in furtherment of the marketing of their services both jointly and as independent enterprises.

CONSULTING:

Upon request by either firm, the other will provide technical, managerial, and other information and consulting services requested subject to the following conditions:

- The receiving firm shall provide the supplying firm with a statement indicating how the information or services will be used.

- Where the information or services supplied have direct commercial value and are utilized for projects in which the supplying firm does not participate in some way, the receiving firm will recompense the supplying firm the full value of such information or services.
- In such situations, both firms will agree, in writing, about the scope of the work involved and the budget and the schedule for such work.

SYSTEMS TRANSFER:

Each firm will share with the other all management and technical systems which it has developed, without restriction. Should either firm wish to incorporate such systems into its ongoing operations, it shall be free to do so provided that:

- All costs incurred by the supplying firm in assisting in such transfers be reimbursed.
- In such situations, both firms will agree, in writing, about the scope of the work involved and the budget and schedule for such work.
- The receiving firm shall not enter into any agreements with third parties for the further transfer of such systems without the express written permission of the supplying firm.

JOINT VENTURES:

Wherever advantageous, both firms will enter into a joint venture to capitalize on their combined capabilities. In such situations, the firms will, together, develop a joint venture plan at the earliest practical point in time. Such joint venture plan will outline the scope of the project and a budget and schedule for its accomplishment as well as all necessary legal, financial, business, insurance, and other conditions required to properly control the enterprise in the best interests of both parties.

COORDINATION:

Upon the signing of this Agreement, and on each anniversary thereof, both firms will prepare an inventory of special skills, capabilities, and relationships which will be used to inform their joint activities and programs. The principals of both firms shall meet every six months to review such activities and programs and to agree on strategy for collaboration for the upcoming 12-month period. Such meetings will be held alternately in the home offices of each firm.

COST ACCOUNTING:

Except as otherwise set out in this Agreement, each firm will absorb its own costs in fulfilling its obligations. Notwithstanding the above, each firm will keep accounting records of such costs, including personnel costs, and will provide the other firm with such records every six months.

In situations where specific budgets are developed—such as for joint ventures, consulting, and system transfers—each firm will provide a full accounting of its costs each and every month for the duration of the project and a final account at the end of the project.

Costs will be the actual raw costs in the country where they are incurred and shall not contain any adjustments or markups to cover overhead or administrative expenses.

CURRENCY AND LANGUAGE:

All budgets will be developed in duplicate in the currency of the countries of both firms, using the published exchange rates at the time of preparing the budget. Costs will be recorded by each firm in its own currency. Revenues will be recorded in the currency of both countries using the published exchange rates at the time of receipt of the revenues. Both firms agree that they will—on the basis of the records outlined above—make adjustments to the final accounts and otherwise make arrangements to fairly share any currency risk arising from changes in exchange rates on the basis of their contribution to the undertaking.

The primary language of communication shall be English. To the extent that translations are required, both shall share equally in such costs, provided that both parties agree in writing thereto for each instance.

CONFIDENTIALITY:

Each firm will respect the confidentiality of all information received from the other and undertake not to divulge any information identified as proprietary to third parties without the express written permission of the supplying firm.

TERM:

This Agreement shall remain in effect for an initial term of one year from the date of signing. At the conclusion of this term, the Agreement will be reviewed in light of the results achieved and the interests of both firms.

Should there be a mutual interest in continuing the Agreement, it will be modified to incorporate any necessary changes and shall remain in effect for a further period of three years. Either firm shall have the right to terminate the Agreement at the end of this period by giving written notice to the other no later than 12 months before the expiration date. Should no notice be given, the Agreement shall be automatically continued for the next three-year period.

LIMITS:

There is no obligation for either firm to involve the other in any project or endeavor in which it is, or might become, engaged, either locally or internationally. Furthermore, both firms recognize that they are divisions of larger enterprises and have limited authority with regard to the actions of their sister divisions.

Nothing in this Agreement shall preclude either firm from entering into a joint venture with any other construction firm provided that such firm will inform the other when such joint venture is created beyond its national borders.

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Ing. Gianfranco Dioguardi
Il Consigliere Delegate

January 1992

BEACON CONSTRUCTION COMPANY
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President

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