A FRAMEWORK FOR STRATEGIC THINKING IN THE GLOBAL MARKET
FOR LARGE-SCALE JAPANESE CONSTRUCTION FIRMS

by

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ABSTRACT

The intent of this thesis is to propose a framework for strategic thinking in the global market for large-scale Japanese construction firms. That framework would enable firms to perform strategic thinking in a changing environment, capturing dynamic aspects of the industry and lead them to succeeding processes toward their choice of strategic position.

The thesis first reviews literature on strategic thinking and finds three distinct powerful strategic analysis models, which together cover virtually all of the major important theories in strategic management. These three models are the Porter Model, the Resource-Based View of the Firm, and the Delta Model.

The thesis then reviews the three models, examining their applicability to the industry, and analyzes their strengths and weaknesses. Based on this analysis, the thesis integrates them and proposes the new framework, which consists of two contiguous approaches, the iterative and the circular dynamic.

Finally, the thesis applies the framework to a Japanese construction firm through some case studies, which allows this thesis to depict practical usage of the proposed framework as well as prove its applicability to the global construction market. This application further develops and complements the framework.

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CHAPTER 1

INTRODUCTION

1.1 Need for Strategic Thinking

Shrinking domestic demands in Japan’s construction market force large-scale Japanese construction firms to go more global. Historically, Japanese contractors have been taking opportunistic strategies since 1966 when construction exports began to take off on a commercial basis. Because the global market has become more important than ever, there are strong needs for a framework of strategic thinking in the global market to develop competitive advantage.

1.2 Strategic Thinking for the Construction Industry

Many studies have been conducted on strategies and tactics for the construction industry. However, only a few studies provide fundamental framework for strategic thinking. This framework best fits a static market but fails to capture the dynamic aspects of the industry. When construction firms think of a global market that is changing more dynamically, they have to have a framework for strategic thinking to capture the dynamics of the industry.

1.3 Purpose of the Thesis

The purpose of the thesis is to propose a Framework for strategic thinking for construction firms, which enables them to strategically think in a changing industry environment and leads to succeeding processes in the direction of the choice of a strategic position. This Framework allows firms to integrate long- and short- term visions in the changing industry.

1.4 Scope of the Thesis

The proposed Framework for strategic thinking can be applicable for other industries and companies. However, the thesis limits its scope to the global market by Japanese large-scale construction firms and shows its applicability to the defined scope through case studies.
CHAPTER 2

BACKGROUND

In this chapter, we explore the background of this thesis. In the first section, we examine not only the global construction industry and Japan's construction industry, but also the need for strategic thinking in the industry. In the second section, we review literature on strategic thinking in the business arena and past studies in the industry.

2.1 Construction Industry

2.1.1 Global Construction Market

The global market has been expanding since the late 1980s. Figure 2.1-1 shows contract dollars/revenues from 1985 to 1997 of the top 225 international contractors by region. International contracts grew from 1987 and doubled for four years from 1987 to 1991. This growth was due to the two factors. Firstly, foreign direct investment (FDI) rapidly increased from the late 1980s. Secondly, the slump of the construction market in the US and Europe in the early 1990s drove many firms to go overseas and especially to Asian countries that were in rapid economic growth. In addition, there were many big infrastructure projects, which became feasible by means of innovative delivery methods such as build-operate-transfer (BOT), build-own-operate (BOO), or build-own-operate-transfer (BOOT). The discontinuity in 1994 shown in Figure 2.1-1 was caused by the Engineering News-Record's (ENR) change of accounting method. ENR counted the top 250 contractors' contract amount from 1985 to 1990, the top 225 contractors' contract amount from 1991 to 1993, and then the top 225 contractors' revenue from 1994 up to 1997. As we have seen, however, the global construction market has expanded since the late 1980s.

However, in 1997, compared with the previous year, the revenue has fallen by about 13%. This sudden drop is likely due to the financial crisis that hit Southeast Asia in mid 1997. However, the Asian financial crisis, and Japan's prolonged slump, have only heightened the uncertainty in the global construction market. Pressure to fill the resulting gap of infrastructure needs and the desire to invest led international contractors to increase participation in financing projects. According to them, ENR could not count several leading international contractors in...
their year-end computing in 1997 because of their delayed responses, and furthermore, ENR analyzes that the global construction is still expanding if we take into consideration the missing data of those leading firms. There are some difficult market sectors in general, but the global construction market is growing as a whole.

Other notable tendencies in the global construction market include the growth of the Asian market and the project delivery methods in that region. As we can see in Figure 2.1-1, Asian market has been the biggest market since 1991. In terms of the delivery methods, funding problems in the various governments and regional financial crises have led contractors to actively participate in financing projects. Therefore, BOT, BOO, BOOT, and so on, which involve contractors' financing, are increasing as delivery methods.
2.1.2 Japanese Construction Industry

2.1.2.1 General Aspects of the Japanese Construction Industry

Japan’s construction market, by the 1980s, had become the largest in the world. In 1992, investment in the construction market in Japan (84.2 trillion yen) was about one and a half times as large as that of the US (54 trillion yen) (Endo 1994). However, with the prolonged economic Japanese recession, its domestic market has been shrinking. Accordingly, many firms are shifting toward the global market, although the international market of the Japanese construction industry has been opportunistic and lacked strategic visions. In the following sections, we discuss two markets of the Japanese construction industry, domestic and international.

2.1.2.2 Domestic Market

As in the US, the construction industry in Japan is also highly fragmented. The largest five firms (Kajima, Obayashi, Shimizu, Taisei, and Takenaka) consist of only about 9.7% of the total market volume on the assumption that the average revenue of each will be 1.4 trillion yen while the total market volume is predicted to be 72 trillion yen for the year 1999.

Before the 1994 bidding policy, Japanese contractors were protected from competition with foreign firms in the domestic market. The designated bidder system and notably “Dango” (a form of collusive activity among contractors) allowed Japanese firms to enjoy monopolistic situations against foreign companies, although there was fierce rivalry among domestic companies.

In 1994, the new bidding policy was executed and some argued that price competition would become strong because of this new system. Foreign firms, however, have not successfully bid on Japanese projects, but, with the declining construction demand, price competition among domestic firms is getting stronger. This situation has lead many firms to reduce their R&D expenditures and other costs in an effort to improve their market share and has produced a competitive domestic climate. By Porter’s terms (see bibliography), all firms are just seeking for operational effectiveness, which he says is not “strategy” and eventually leads to a climate of “mutually destructive battles.”
2.1.2.3 International Market

In this section, we will go through the history of Japan's construction export and provide the history chart below. Before World War II, construction export was driven mainly by military purposes. After the war, many construction firms worked overseas for infrastructure projects that were reparation work for compensation. It was not until 1966 that Japanese construction firms first started going overseas on a commercial basis, firstly in South East Asia, and then, following Western and Korean companies, into the Middle East in response to the large construction demand. However, unsuccessful results in the Middle East market, and then large domestic demands kept construction firms within Japan from 1980 to 1990. After the so-called “bubble economy” burst, domestic demands continue to decrease and many firms are seeking the opportunity to expand into the international market.

The path of global expansion of these construction firms has shown their opportunism and lack of strategy. The firms seem to have thought the global market a supplement of the domestic market and lacked the foresight to portfolio for risk management, and to recognize the incentives for globalization.

1897 - 1900: The first wave of construction exports started with the construction of a railway in Korea for military purposes.

1900 - 1945: Wartime conditions stimulated construction export for colonial and governmental military works.

1945 - 1954: Japanese construction firms worked for US military works in Okinawa, Japan, learning technology and management through joint ventures with US firms such as Morrison-Kundsen, Bechtel, Pomeloy, and Kiewit.


1966 - 1973: Construction companies started working in foreign countries on a commercial basis moving firstly into Southeast Asia. Japanese promoted these construction exports with the support of Ex-Im Bank, ODA, and others.

1973 - 1980: Construction firms started to enter the Middle East and faced competition with Western and Korean firms.
1980 – 1990s: Investments by Japanese companies increased in the Asian markets that were in rapid economic growth. From 1984, many construction firms entered the US responding to Japanese companies’ investments in that market.

2.1.3 Globalization of Construction

2.1.3.1 Terminology

Porter (1986) as well as many others introduced a framework by which we can study the extent of globalization. He distinguished quadrants based on the coordination and configuration of activities, which are transnational, global, multi-national, and home-based (See the figure below). Further details are shown in Section 3.1.5, Chapter 3.

Sugimoto (1990) further developed this framework and proposed a model of globalization for the construction industry. This model explains globalization based on three elements, that is, geographical, internal, and external. Geographical globalization is the process by which a firm expands its geographic market and competes in vast geographic markets, at maximum “worldwide.” Internal globalization is concerned with how firms disperse various internal activities geographically and how they coordinate them over geographic distances. Finally, external globalization is defined by how firms configure the locations of external inputs geographically and how they coordinate the flow of inputs to projects in multiple locations. In his globalization theory, external inputs are defined as sourcing all goods and services to be incorporated in final outputs of construction, that is, not only labor, materials, and equipment but services by subcontractors, knowledge from more specialized consultants, capital from financial institutions, and even participation of joint-venture partners.

He grouped engineering and construction (E&C) firms into three. The first and second groups are global in three elements, that is, geographical, internal, and external. The difference of the two groups is the way in which they compete. That is, one competes based on efficient operation internally and externally, and the other competes by leveraging their home country advantages. The third group is global only geographically and competes on the basis of local specific advantages.

Among the four distinguished international strategies espoused by Porter and others, it is considered that the most sophisticated strategy is the transnational one where high levels of coordination and configuration are required. In general, the international strategy of firms seems
to evolve toward the transnational type from global, multi-domestic, and home-based types. The below figure shows this movement (Figure 2.1-2).

Figure 2.1-2: Types of International Strategy

"International" and "internationalization" are often used for a narrower meaning than they should be. So are "global" and "globalization." In this paper, we use "globalization" and "global" meaning all aspects of the above concepts and even the evolving movements.

2.1.3.2 Motivation

Before going to details, we had better think about why firms, in general, should go global and what the reasons of globalization are. Firms go global traditionally because of three reasons, which are called "classical motivations" and include:

- Resource-seeking,
- Market-seeking,
• Labor-seeking.

Recent research on motivation identified other new motivations, which are called “emerging motivations” and include:

• Technology-seeking,
• Competitive-strategy,
• Geographic diversification/risk reduction,
• Information-seeking.

These motivations drive firms to go global and their global strategies vary depending on their choice or priority of motivations. Furthermore, a complementary analysis of globalization drivers is provided by Yip et al. (1988), who identify a number of external drivers of globalization and classify them into four main factors such as competitive, economic, market, and environmental factors. Market factors include homogeneous market needs, global customers, shortening product lifecycle, transferable brands and advertising, and internationalizing distribution channels. Competitive factors include competitive interdependence among countries, global moves of competitors, and the opportunity to pre-empt a competitor's global moves. Environmental factors include falling transportation costs, improving communications, government policies, and technology changes. Finally, economic factors include worldwide economies of scale in manufacturing or distribution, steep learning curve, worldwide sourcing efficiencies, significant differences in country costs, and rising product development costs.

Having now reviewed the motivation for globalization of firms in general, we now review those motivations specifically as they apply to construction firms. Strassman and Wells (1988) point out incentives and disincentives to globalization for Japanese E&C firms. The summary of both incentives and disincentives is provided below:

**Incentives**

• Stabilization of construction investment at home and the resultant decrease in its contribution to the gross national product (GNP)
- Reputation for high levels of technology
- Increasing official development aid (ODA) to developing countries
- International and local intelligence networks of Japanese trading firms
- Foreign direct investment (FDI) by Japanese firms

Disincentives

- Expanded domestic construction market
- Historical insularity
- Lack of experience in overseas and international transactions
- Insufficient and poor personnel for overseas construction
- Dominance of Western languages
- Historical and global spread use of European and American contract laws, systems, and practices
- Historically inferior position of Japanese consulting engineers and architects
- Intense overseas competition among Japanese contractors caused by similar modes of entry
- Rise in the value of yen
- Intensified competition with European, US, and NIC (Newly Industrializing Country) contractors

By reviewing literature on globalization motivations or incentives and disincentives, we conclude that there is no strong potential for globalization of the construction industry. However, if we look at the global market and imperative needs of infrastructure development, there is surely potential of further globalization for capable companies.

2.1.3.3 Dynamics of the Industry Structure in the Global Market

When we consider the global market, the construction industry varies significantly country-by-country. Various countries are in different development stages and, in addition, the construction industry in each country is also changing. These dynamics are explained in several theories that follow.
The “product life cycle” theory by Ray Vernon (1979) supports some aspects of the industry changes. Firstly, a product is developed by an innovative firm, the domestic market becomes mature, and then, the firm is able to export. Secondly, foreign market grows, and the production process is transferred to the county of export.

Moavenzadeh and Hagopian (1983) argue that there are five stages of evolution of the construction industry in developing countries, which are summarized below.

Stage 1: Foreign firms handle most of the larger projects, especially in infrastructure development
Stage 2: As a result of subcontract work on the first stage projects, indigenous subcontracting firms develop
Stage 3: Small local contractors execute the smaller projects
Stage 4: Local contractors take over most local work, regardless of magnitude, forming joint ventures with foreign firms as necessary
Stage 5: Local contractors may go abroad

Porter’s national development theory (1990) explains dynamics. In studying many nations’ economies, he recognized four stages in competitive development: that is, factor-driven; investment-driven; innovation-driven; and wealth-driven.

When we look at the construction industry of different countries, the level of development is different and, in addition, it continues to evolve to the next development level. When firms formulate strategy, especially for the global market, they have to incorporate the dynamic aspect.

2.2 Overview of Strategic Thinking

In this section, we review the literature on strategic thinking from the historical perspective.
2.2.1 SWOT Concept

By the 1960s, strategic thinking focused on matching a company’s “strength” and “weakness” – its distinctive competence – with the “opportunities” and “threats” (or risk) that it faces in the marketplace. This framework, referred to as SWOT, is still used today.

2.2.2 Experience Curve

In the 1960s, a consulting company based in Boston (Boston Consulting Group) developed a new framework utilizing a learning curve. The theory of the learning curve argued that, for each cumulative doubling of experience, total costs would decline roughly 20 to 30 percent due to economies of scale, organizational learning, and technological innovation.

2.2.3 Portfolio Analysis

The portfolio analysis was evolved from the experience curve or learning curve. In the 1970s, Boston Consulting Group (BCG) started using the “Growth-Share Matrix” and another consulting company, McKinsey, started using the GE/McKinsey 9-block matrix with the concept of strategic business units (SBUs). The portfolio analysis theory is that a diversified company has several business units (SBUs) with points differently positioned on each experience curve, and thus, the company should allocate its resources according to each SBU.

2.2.4 Two Basic Dimensions of Strategic Analysis

The popularity of portfolio analysis frame-working subsequently promoted research on two basic dimensions: industry attractiveness; and competitive positioning. Presented below are the results of this research Some frameworks for industry attractiveness and competitive position are. In addition, we review some frameworks that were developed from the research on the competitive position.

Industry Attractiveness Analysis:

Many economists contributed to the advancement of industry analysis, especially, in the field of industrial organization (IO), and then, some of their ideas and conclusions were transferred to use in the strategic management field. IO explored the structural reasons why some industries were more profitable than others, although its main concern was not for a
business policy but for a public policy. In this trend, Michael E. Porter (1980) presented his framework with an attempt to apply IO to business, focusing on a business policy objective that is to maximize profit, rather than a public policy objective that is to minimize excess profits. Porter’s framework of industry analysis is the notable “five-forces,” which we discuss later in this paper.

**Competitive Position:**

The emphasis on the competitive position came from the idea that, while differences among the average profitability of different industries were large, differences of profitability within an industry were even larger. Most of the businesses tried to alter their own competitive positions rather than the overall attractiveness of the industry. Focal points were cost and their customers. Cost analysis led to the disaggregation of a business’s entire structure into separate activities and the identification of cost drivers. In this direction, the generic strategies proposed by Porter (1980) came out. He argued that successful companies had to choose to compete either on the basis of low cost or by differentiating products through quality and performance characteristics. Porter’s value chain presented in his successive book (1985), “Competitive Advantage,” provided a framework to analyze cost and differentiation through a business’s activities.

**Business System Redesign:**

The development of the framework for disaggregation of a business’s activities such as Porter’s Value Chain and McKinsey’s Business System led to a rather different approach to enhancing the competitive position. The focal point was not product/service, but process. Total Quality Management movements started with this trend in the 1980s. The focus on the cost, or specifically the spread between a company or division’s rate of return and its cost of capital, led to the “value-based strategic management.” The value-based strategic management argued that the “think long-term mindset” of many top managers had enabled large numbers of business units to keep “unprofitable strategies in place for long intervals” and increased the pressure on managers.

In the early 1990s, those ideas were replaced by a concept of “reengineering,” which focused much more on business processes. Reengineering meant radical redesign of business
processes for dramatic improvement. However, the culmination of this concept experienced a quick demise. Managers argued that reengineering was just “downsizing” and radical reformation was too impractical. Finally, the focus of strategic thinking about positioning and business systems reverted to the traditional view proposed by Porter. Reasonably, his frameworks such as five-forces and value chain analyses are still popular in industries.

2.2.5 Dynamic Analysis

In the 1970s, the portfolio analysis, with the experience curve, became the most prevalent framework to generate strategy. Many consulting companies came up with their own matrices for portfolio analysis. However, questions were raised about the experience curve and portfolio analysis theories around the same time that two oil crises hit industry. Questions to the experience curve were the consequence of intensively pursuing a cost minimization strategy (e.g. one based on the experience curve), thus, reducing their ability to make innovative changes and to respond to those introduced by competitors. Arguments against the portfolio analysis theory were that the recommendations varied with different frameworks, and that they led managers to focus on minimizing financial risks rather than investing in new opportunities that required a long-term commitment of resources.

Those arguments agreed that the above frameworks were static. They did not address the dynamics of competitive processes. Strategic thinking shifted some attention to more dynamic analyses with dynamism, multidimensionality and uncertainty. Some of the frameworks for capturing the dynamic aspects of competition included game theory, the Resource-Based View of the firm, dynamic capabilities, and commitment. Among these frameworks, we discuss in detail the Resource-Based View of the firm in the next chapter.

2.2.6 Strategic Positioning

As we have discussed in the previous two sections, positioning was once the heart of strategy; however, it was rejected. It was because positioning was too static for dynamic markets and changing technologies and positioning was accused of its leading to mutually destructive competition with such frameworks as “value-based strategic management” and “reengineering.” However, positioning is again becoming important, arguing that the previous problem was a result of the failure to distinguish operational effectiveness and strategy.
In this section, we refer to two positioning theories, which are basically same. The first one is Porter’s positioning theory, which was introduced with his article, “What is Strategy?” The second one is Arnold C. Hax and Dean L. Wilde II’s positioning theory called “Delta Model,” which was introduced with their unpublished paper.

“What is Strategy”:

In Porter’s recent paper in the Harvard Business Review, “What is Strategy?” he argues that operational effectiveness is not the strategy (1996). Operational effectiveness means performing similar activities better than rivals perform them. The essence of strategy is in the activities – choosing to perform activities differently or to perform different activities to rivals.

He argues that strategic positioning emerges from three distinct sources: variety; needs; and access. Variety-based positioning means serving subset of an industry's products and services. This positioning can serve a wide array of customers, but for most, it will meet only a subset of their needs. Needs-based positioning is that of serving most or all the needs of a particular group of customers, which comes closer to traditional thinking about targeting a segment of customers. The third basis for positioning is that of segmenting customers who are accessible in different ways. Although their needs are similar to those of other customers, the best configuration of activities to reach them is different. Thus, this is called access-based positioning.

These bases carry the understanding of generic strategies – cost leadership and differentiation – to a greater level of specificity. In his article, he visualizes his concept with the productivity frontier (see Figure 2.2-1) which constitutes the sum of all existing best practices at any given time and is either in the cost leadership or differentiation strategies. When a company improves its operational effectiveness, it moves toward the frontier. With this conceptual figure, the “three positioning” strategy can make companies move outward or to a greater level. Porter argues that “generic strategies” still remain useful to characterize strategic positions at the simplest and broadest level.
Delta Model:

The Delta Model is the strategic positioning theory introduced by Hax and Wilde. They propose the model to challenge the following five pressures to business. Four of them come from the external environment: changes in industry structure; escalation of customer requirements; intensification of global competition; and pervasive role of technology. The fifth pressure is corporate inflexibility, which is an internal constraint in reaching out to the environment.

Although the central issue is strategic positioning, the Delta Model has other complementary frameworks. The model is the set of frameworks composed from four subsets: the business model; the adaptive processes; segmentation; and feedback. The business model creates a distinctive strategic vision. Accordingly, the adaptive processes link strategy with execution. Segmentation allows firms to focus, to measure, to learn, and to innovate. Finally, feedback allows firms to regain flexibility and adapt themselves to uncertainty. We discuss further details in the next chapter.

2.3 Previous Research of Strategic Thinking in the Construction Industry

There is much literature on strategies in the construction industry. Some strategies suggest directions for engineering and construction (E&C) firms to take in the future. Others are concerned with planning entry to the global market, which include such areas as modes of entry,

Those strategies may direct or imply some future steps for firms. However, only some research provides fundamental frameworks for strategic thinking. In the following pages, we review some of the literature on strategic thinking.

Ajula (1984) applied a formal strategy formulation framework to a Finnish construction firm and proved that the framework fit well for a construction firm. The framework used in this thesis was mainly derived by Porter’s establishments, streamlined by Hax.

Lin (1995) applied various analytical tools to the construction industry, which include the SWOT analysis and Porter’s frameworks such as five-forces analysis, value chain analysis, segmentation matrix, and three generic strategies. In addition, he suggested the use of those strategic analysis tools in conjunction with organizations as categorized by Mintzberg.

Sugimoto (1990) applied Porter’s value chain analysis and the concepts of configuration and coordination to capture the globalization of the construction industry. We identified that his framework is powerful to capture the state of globalization of E&C firms as discussed in Section 2.1.3.

There are several papers on strategic thinking published by the American Society of Civil Engineers (ASCE), which are mainly concerned with operational effectiveness. Maloney and Hancher (1997) introduced Porter’s five-forces analysis and generic strategies to the construction industry. Warszawski (1996) introduced the comprehensive strategy formulation processes with Porter’s framework.

All of the previous research commonly focuses on Porter’s Model. As described in the previous section, Porter model proves still to be the most popular framework in the construction industry. However, we conclude that it is difficult to consider growth or capture dynamics with strategic thinking frameworks by Porter Model, as Warszaeski (1996) implied in his paper.
CHAPTER 3

THREE STRATEGIC ANALYSIS MODELS

In the previous chapter, we reviewed the literature on strategic thinking from the historical perspective, and have identified three strategic analysis models, which together cover almost all of the major important theories in strategic management. These three are: Porter Model; Resource-Based View of the Firm; and Delta Model.

In this chapter, we first, describe more details of the three strategic analysis models for use in later chapters. Secondly, we generically apply those models to the construction industry.

3.1 Porter Model

In this section, we describe several frameworks provided by Porter, which include five-forces analysis, three generic strategies, value chain analysis, business segmentation, and configuration - coordination matrix.

3.1.1 Five-Forces Analysis

In order to select the desired competitive position of a business, it is necessary to begin with the assessment of the industry to which it belongs. To accomplish this task, we must understand the fundamental factors that determine its profitability prospects because this indicator embodies an overall measure of industry attractiveness.

By far the most influential and widely used framework for evaluating industry attractiveness is the five-forces model proposed by Michael E. Porter. Essentially, he postulates that there are five forces that typically shape the industry structure: intensity of rivalry among competitors; threat of new entrants; threat of substitutes; bargaining power of buyers; and bargaining power of suppliers. These five forces delimit prices, costs, and investment requirements, which are the basic factors that explain profitability prospects, and henceforth, industry attractiveness. Figure 3.1-1 illustrates that the generic structure of an industry is represented by the main players who are competitors, buyers, suppliers, substitutes, and new entrants and their interrelationship.
The strength of each of the five competitive forces is a function of industry structure, or the underlying economic and technical characteristics of an industry. Its important elements are shown in the following sections.

3.1.1.1 Intensity of Rivalry

The rivalry among competitors is at the center of the forces contributing to industry attractiveness. Out of the many determinants of rivalry presented below, four of them stand out: industry growth, the share of fixed cost to the total value added of the business, the depth of product differentiation, and the concentration and balance among competitors.

- Concentration and balance among competitors
- Industry growth
- Fixed (or storage) cost
- Product differentiation
- Intermittent capacity increasing
• Switching costs
• Corporate strategic stakes

Exit barriers are economic, strategic, and emotional factors that keep companies competing in businesses even though they may be earning low or even negative returns on investment. The major sources of exit barriers are the following:

• Asset specialization
• One-time cost of exit
• Strategic interrelationships with other businesses
• Emotional barriers
• Government and social restriction

In the E&C industry, rivalry is generally very high. Competition is often likely to be a zero sum game. Low levels of differentiation and switching costs make customers perceive the product or service as a commodity; and therefore, competition becomes intense on price and service.

3.1.1.2 Threat of New Entrants

The threat of entry into an industry depends on the barriers to entry that are present, coupled with the reaction from existing competitors that the entrant can expect. If barriers are high and/or the new comer can expect sharp retaliation from entrenched competitors, the threat of entry is low. Major sources of barriers to entry are as follows:

• Economies of scale
• Proprietary product differentiation
• Brand identification
• Switching cost
• Access to distribution channels
• Capital requirements
• Access to latest technology
• Experience and learning effects

Government actions play an important role on the threat of new entrants. Specifically, they are important for us to capture issues of regulation and protectionism that are critical to determine industry attractiveness in a global setting. Government actions include:

• Industry protection
• Industry regulation
• Consistency of policies
• Capital movements among countries
• Custom duties
• Foreign exchange
• Foreign ownership
• Assistance provided to competitors

With regard to those factors, some characteristics of the E&C industry are: economies of scale allow cost savings; the product is not well-differentiated, but the services that accompany it are; capital requirements are low given the ability to lease anything that is needed; the cost to a customer of switching to another supplier is low; and there is a significant learning or experience curve, but it cannot be kept proprietary because of the movement of personnel between firms.

3.1.1.3 Threat of Substitutes

It is not only the firms who participate in the industry and potential new comers that are central forces in determining industry attractiveness, but also, we must consider firms offering substitutes, who can either replace the industry products and services or present an alternative to fulfill that demand.

• Availability of close substitutes
• User's switching costs
• Substitute producer's profitability and aggressiveness
• Substitute price-value
In the construction industry, threat of substitutes is generally regarded as weak. However, some segments of the industry face more threat. For example, mechanical contractors today are competing with public utility companies to serve homeowners heating and air conditioning systems.

3.1.1.4 Bargaining Power of Suppliers and Buyers

Porter’s wording, “bargaining power of suppliers and buyers,” suggests that there is a threat imposed on the industry by an excessive use of power on the part of these two agents. Porter can be interpreted as indicating that a proper strategy to be pursued by a business firm will have, as a key component, the attempt to neutralize suppliers’ and buyers’ bargaining power.

Power of suppliers:
- Number of important suppliers
- Availability of substitutes for the suppliers’ products
- Differentiation or switching cost of suppliers’ products
- Suppliers’ threat of forward integration
- Industry threat of backward integration
- Suppliers’ contribution to quality or service of the industry products
- Total industry cost contributed by suppliers
- Importance of the industry to suppliers’ profit

Power of buyers:
- Number of important buyers
- Availability of substitutes for the industry products
- Buyers’ switching costs
- Buyers’ threat of backward integration
- Industry threat of forward integration
- Contribution to quality or service of buyers’ products
- Total buyers’ cost contributed by the industry
- Buyers’ profitability
With regard to supplier power in the E&C industry in general, there are many potential suppliers competing with one another, thereby reducing the bargaining power of individual suppliers.

On the contrary, buyer power is quite strong. Buyers compete with the industry by forcing down prices, bargaining for higher quality or improved services, and playing competitors against each other – all at the expense of industry profitability. Because of the way engineering and construction work is awarded, the buyer has a great deal of power. Many buyers perceive this work as standard or undifferentiated and procure it strictly on price. There are many alternative sources of this work that gives the buyer leverage.

3.1.2 Value Chain Analysis

The focus of analysis of the value chain is the strategic business unit (SBU). The underlying principle is that all of the tasks performed by a business organization can be classified into nine different broad categories. Five of them are so-called primary activities, and the other four are labeled support activities. A full representation of the value chain is given in Figure 3.1-2.
The primary activities are those involved in the physical movement for raw materials and finished products, in the production of goods and services, and in the marketing, sales, and subsequent services of the outputs of the business firm. To some extent, they can be thought of as the classical managerial functions of the firms, where there is an organizational entity with a manager in charge of a very specific task, and with full balance between authority and responsibility.

The support activities, however, are much more pervasive. As their name indicates, their essential role is to provide support not only to the primary activities, but to each other. They are composed of: the managerial infrastructure of the firm, which includes all processes and systems to assure proper coordination and accountability; human resource management; technology development; and procurement.

To be successful, a firm also needs to look for competitive advantages beyond its own operations, into the value chains of its suppliers, distributors, and customers. In other words, a
firm's value chain is embedded in a larger stream of activities that Porter terms the "value system." By this system, we can capture a firm's upstream and downstream activities within the industry and their value chains. Figure 3.1-3 is a typical value system in the construction industry. This value chain is frequently seen in the general contracting types of projects. Depending on the delivery methods and project types, the value system can involve other players such as financial institutions, tenants, outside technical institutions, and so on.

![Value System in the Construction Industry](image)

**Figure 3.1-3: Value System in the Construction Industry**

### 3.1.3 Three Generic Strategies

Porter introduces his generic competitive strategies in conjunction with the value chain analysis, which has been discussed in detail in the previous section. This concept implies that there are distinct and mutually exclusive ways for business to achieve competitive advantage. Porter states that a business can enjoy a competitive advantage exclusively by one of two basic generic strategies: cost leadership or differentiation. These two generic ways of competition can be combined with the market scope in which the firm attempts to achieve competitive advantage. The resultant alternatives lead to three generic strategies, depending on whether the firm is seeking a competitive position in the overall industry, or whether it will concentrate its activities on a narrow market scope. These generic strategies are; overall cost leadership, differentiation, and or focus. See Figure 3.1.4.
3.1.3.1 Overall Cost Leadership

This positioning implies that the strategic business unit (SBU) establishes a position that has a significant cost advantage over all of its competitors in the industry. To achieve such a position, we have to understand first the critical activities in the SBU value chain that are the sources for cost advantage, and then to deploy the necessary capabilities to excel in one or more of them. Cost leadership requires aggressive construction of efficient-scale facilities: vigorous pursuit of cost reductions from experience; tight costs and overhead control; avoidance of marginal customer accounts; and cost minimization in areas such as R&D, service, sales force, advertising, and so on.

In the construction industry, price will continue to be a major influence on buyers of engineering and construction services. The firm that can offer quality services at prices lower than their key competitors will gain their market share. The key to success is developing cost effective methods for delivery of quality services that cost less than the methods of competitors. Creativity in the organization of resources and in the production of final products for the owner is essential. Since competitors will eventually learn of and adapt new ideas, the process is a continuous pursuit. In addition, a high volume of work will most likely be required.
3.1.3.2 Differentiation

This positioning implies that the business unit has to offer something unique, unmatched by its competitors, and is valued by its buyers beyond offering simply a lower price. Once again it is necessary to understand the value chain, and the deployment of the necessary skills to enable those potentials to be realized. Differentiation calls for creating something that is perceived industry-wide as being unique. Approaches to differentiation can take many forms: design or brand image; technology; features; customer service; dealer network; or other dimensions.

In the construction industry, seeking and offering unique services better than a competitor will enable firms to attain desired profits. Some owners, especially in the private sector, will often pay more to gain unique services of high quality. A major opportunity today is in the area of design-build projects. Many owners are seeking firms that can offer the total package for a project with resulting high quality. If the project can be completed in a timely manner, they are even willing to pay slightly higher prices, and although this is a major risk for firms offering such services, the resultant profit rewards those that can afford to take this risk.

3.1.3.3 Focus

This positioning consists of concentrating on a particular buyer group, segment of the product line, or geographic market. As with differentiation, focus may take many forms. Although the low-cost and differentiation strategies are aimed at achieving those objectives industry-wide, the entire focus strategy is built around servicing a particular target very well, and each functional policy is developed with this in mind.

There are several opportunities for engineering and construction firms to use the focus strategy. A firm can specialize in a specific type of work and be so expert at it that it obtains the desired work volumes and profits. They can also concentrate on providing service to a buyer group that is not well-served at present or they could select a geographic region to work in that had few competitors that can match their services. There are always risks involved, but it is a feasible approach.
3.1.4 Segmentation Matrix

First, firms have to define the market where they want to compete. For this purpose, Porter’s industry segmentation matrix is powerful. The segmentation matrix is a tool that can show where in the industry a firm should compete.

Industries are not homogeneous. Segments of industry have a structure just as industries do, and the strength of the five competitive forces often differs from one part of an industry to another. Segments of an industry thus frequently differ widely in their structural attractiveness and in the requirements for competitive advantage in them.

Porter suggests that a business use such variables as products, channels, buyers, and geographic locations. In the construction industry, the market is fragmented and can be segmented along several lines:

- Types of project: residential, infrastructure, manufacturing, industrial, petroleum, water, sewer/waste, transportation, hazardous waste, power, and others.
- Types of Owner: public and private sectors.
- Geographical locations: international regions (such as North America, Asia, Europe, and so on), countries, regions in those countries, and further smaller areas.
- Service types: architectural/engineering, general contracting, CM, design-build, turnkey, build-operate-transfer (BOT), and so on.

The segments to be covered and analyzed vary in accordance with firms’ business size and diversity.

Figure 3.1-5 shows an example of how a large-scale Japanese construction firm can find potential markets. We have used such variables as sources of funds, locations, types of service, types of owner, and types of project. An important concept of business segmentation for strategic thinking is that, in each segment, the strength of the five competitive forces differs from one part of segments to another.

In the figure, several acronyms are utilized: GC, general contracting; DB, design-build; CM, construction management; TK, turnkey; and BOT, build-operate-transfer.
3.1.5 Configuration and Coordination

Porter (1987) as well as Bartlett (1986) both propose the idea of configuration and coordination in the global market. Notable issues particularly in the global arena, as opposed to the domestic one, are that strategy differs in two key dimensions of how a firm competes globally. The first dimension is what Porter terms the “configuration of a firm’s activities,” which refers to where in the world each activity in the value chain is performed, as well as how often. The second dimension is what he terms the “coordination of a firm’s activities,” which refers to how activities are performed in different countries and are then coordinated with each other.

This framework is the basis of Sugimoto’s (1990) globalization model. He proposed three globalization theories, geographical, internal, and external globalization: geographical being the physical global existence of firms; and internal and external globalization relating to the intra- and inter-firm activities respectively. To measure the extent of globalization, he separates firms’ activities into two categories: those activities involving intra-firm resource distributions; and those involving inter-firm resource distributions.
3.2 Resource-Based View

The idea of looking at firms in terms of their resource endowments is an old one, and was revived in the 1980s by Wernerfelt (1984). Since then, research by Prahalad and Hamel (1990), Peteraf (1993), and others, has developed the idea, the Resource-Based View (RBV) of the firm. The RBV argues that superior product market positions rest on the ownership of scarce, firm-specific resources and that firms must deploy their key resources across product markets in ways that maximize total profits rather than the profits in individual markets. It represents a major departure from the strategic approach based on market-driven considerations. The RBV postulates that the central sources of competitive advantage are factor-driven; that is to say, they depend on the development of resources and capabilities on the part of the firm.

The competitive advantage is created when resources and capabilities that are owned exclusively by the firm are applied to developing unique competencies. Moreover, the resulting advantages are retained inside the firm, not appropriated by external parties. Finally, the timing
of the acquisition of the necessary resources and capabilities is so opportune that their cost will not offset the resulting benefits. If all of these conditions are met, the competitive advantage that is created will generate an incremental economic value for the firm. The four basic premises of the Resource-Based View model to achieve competitive advantage are: unique competencies; sustainability; appropriability; and opportunism and timing. The essence of this Resource-Based View is depicted in Figure 3.2-1.

![Figure 3.2-1: The Resource-Based View](image)

**3.2.1 Unique Competencies**

Resources and capabilities are the sources of unique competencies for the firm. Resources could be both tangible and intangible, and are converted into capabilities when the firm develops the necessary organizational routines to use them effectively.
Tangible resources are financial resources and physical assets, and intangible resources are reputation, customer orientation, product innovation, technology superiority, and so on.

3.2.2 Sustainability

For a competitive advantage to be sustainable, the conditions of uniqueness associated with a business unit strategy should be preserved. This means that there should be no threat of either substitution or imitation. From a resource-based point of view, the resources of a firm must have the following attributes to hold the potential for sustainable competitive advantage: they must be valuable; scarce; and difficult to imitate or substitute.

3.2.3 Appropriability

A strategy that is both unique and sustainable would generate a significant economic value. The issue of appropriability addresses the question of who will capture the resulting economic rent. Sometimes, the Owners of the business unit do not appropriate the totality of the value created because of the gap that might exist between ownership and control. Non-owners might control complementary and specialized factors that might divert the cash proceeds away from the business. This type of dissipation is called "holdup."

The second threat to the appropriability of the economic value is referred to as "slack." It measures the extent to which potentiality of the economic value realized by the business unit is significantly lower than that which potentially could have been created. While "holdup" produces a different distribution of the total wealth created, "slack" reduces the size of this wealth.

3.2.4 Opportunism and Timing

One other condition that is necessary to obtain competitive advantage occurs prior to establishing a superior resource position. It is necessary that the cost incurred in acquiring the resources is lower than the value created by them. In other words, the cost implicit in implementing the strategy of a business unit should not offset the value generated by it.
3.2.5 Resource Classification

Resources are classified into three broad categories: tangible assets; intangible assets; and organizational capabilities. A brief description for each is provided below.

Tangible Assets:

Tangible assets are the easiest to evaluate, and often are the only resources that appear on a firm’s balance sheet. They include real estate, production facilities, and raw materials, among others. Although tangible resources may be essential to a firm’s strategy, due to their standard nature, they rarely are a source of competitive advantage.

Intangible Assets:

Intangible assets include such things as company reputation, brand name, culture, technological knowledge, patents and trademarks, and accumulated learning and experience. These assets often play an important role in competitive advantage (or disadvantage), and firm value.

Organizational capabilities:

Organizational capabilities are not factor inputs like tangible and intangible assets; they are complex combinations of assets, people, and processes that organizations use to transform input into output. The list of organizational capabilities includes a set of abilities describing efficiency and effectiveness: low cost structure; “lean” manufacturing; high quality production; and fast product development.

3.3 Delta Model

The Delta Model proposed by Hax and Wilde (1998) is a new strategic analysis framework for the current business environment. They argue that there are five pressures on the business. Four of them come from the external environment: changes in industry structure; escalation of customer requirements; intensification of global competition; and pervasive role of technology. The fifth pressure is corporate inflexibility, an internal constraint to reaching the environment. Collectively these forces are challenging the foundation of most conventional
business models. These challenges are requiring many companies to think of their business models not incrementally but fundamentally and include:

- Rather than concentrating on industry structure, firms must look deeper into their capabilities and resources.
- The customer is replacing the product as the central focus of business economics.
- The international diversity is being transformed into the definition of a single worldwide standard.
- The challenge from technology is to make it into a competitive advantage rather than an unproductive cost.
- Firms need a trusting working place in order to effectively pursue all of the above.

The Delta model is the set of frameworks composed from four subsets: the business model; the adaptive processes; segmentation; and feedback. The business model creates a distinctive strategic vision. Accordingly, the adaptive processes link strategy with execution. Segmentation allows firms to focus, measure, learn, and innovate. Finally feedback allows firms to regain flexibility and adapt themselves to uncertainty.

In this section, the focal point of our discussion is the business model and the adaptive processes. After providing general frameworks postulated by Hax and Wilde, we show the generic application of the business model to the construction industry.

3.3.1 Business Model

The business model consists of three distinctive strategic visions or positions: Best Product; Total Customer Solutions; and System Lock-In positioning. Examples of these three positions are:

- **Best Product:**

  The most influential framework in strategic positioning is by Porter (1980) termed generic strategies, involving cost leadership and differentiation, which we have discussed. Although Porter’s cost leadership and differentiation are distinctive strategic positions, Delta Model merges them into this one position.
• **Total Customer Solutions:**

Worldcom is in the telecommunication industry, acquiring many companies since its inception. The focus of acquisition is not to create the lowest cost product, but instead, to expand the breadth of its products through many acquisitions. They now have a small product market share across many products. Their focus of acquisition is not for product differentiation, or Best Product positioning, but rather one that is based upon a focus away from the product and toward the customer that Delta Model terms Total Customer Solution.

• **System Lock-In:**

Two giant companies, Microsoft and Intel, emerged with the recent computer industry. It is difficult to explain their positions by the traditional strategic positioning framework espoused by Porter. The source of their success is a distinctive competitive position that is not Best Product, but rather one that is supported by the economics of the system as a whole.

Figure 3.3-1 shows the triangle that represents a business model and its three potential options.
3.3.2 Best Product

The Best Product positioning builds upon the classic forms of competition through low cost and differentiation. Its relevant economic drivers are centered on the product. Cost leadership is achieved through the aggressive pursuit of economies of scale, product and process simplification, and significant product market share that allow firms to exploit experience and learning effects. Differentiation is obtained by enhancing product attributes in a way that adds value to the customer. This differentiation can be achieved through technology, brand image, additional features, or special services. Every strategic option searches for the attainment of some degree of bonding with the customer, which is reflected through a significant switching cost.
3.3.3 Total Customer Solutions

The Total Customer Solutions position is based on a wider ranging offer of products and services, which hopefully satisfies most, if not the entire, customer's needs. This is more than just offering a portfolio of generic standardized products. Instead, firms might offer a broad bundle of products and services that aim at targeting and customizing to the individual needs of a specific customer. In that respect, the most relevant performance measurement of this option is customer market-share. Customer bonding is obtained through close proximity to the client that allows firms to anticipate the needs, and work jointly in developing the customer's new products. Learning and customization enhance bonding. Learning has a dual effect: the investment the customer makes in learning how to use the firms' product and services can constitute a significant switching cost; and the firms' learning of the customer's needs will increase their ability to satisfy his or her requirements. Both have a positive impact in the final bonding relationship. Often this strategic option calls for the development of partnerships and alliances, which could include other suppliers, competitors, and customers linked by their ability to complement a customer offering.

3.3.4 System Lock-In

The System Lock-In position has the widest possible scope. Instead of narrowly focusing on the product or the customer, this option is now concerned with all the meaningful players in the system that contribute to the creation of economic value in the industry in which the business resides. In this strategic position, bonding plays its most influential role. Besides the normal industry participants such as buyers, suppliers, channels, and potential new entrants, the model is particularly concerned with nurturing, attracting, and retaining the so-called "complementors," which was first defined by Brandenburger and Nalebuff (1996) with their book, "Co-opetition." By their definition, the complementor is not a competitor; it is a provider of products and services that enhance a firms' offering. Typical examples would be: computer hardware and software producers; high fidelity equipment manufactures and CD disk providers; TV sets, video recorders, and videocassettes; telephone handsets and telecom networks. The critical issue here is to look at the overall architecture of the system in its broadest sense to see how one could gain the complementor's share in order to gain competitor's lock-out and customer's lock-in. The epitome of this position is the de-facto proprietary standard.
3.3.5 Adaptive Processes

Once the organization adopts its strategy, its business processes must be aligned to support the strategy. Through those processes, the strategy is linked to execution. Although there is a great deal of controversy surrounding the definition and number of the appropriate business processes in the firm, the model identifies three processes – developing new products, delivering new products to customers, and managing customer relationships. These processes are termed the “Adaptive Processes” that are always present and are the recipients of key strategic tasks. They include Operational Effectiveness, Customer Targeting, and Innovation.

- **Operational Effectiveness** is responsible for the delivery of products and services to the customer. In a traditional sense, this includes all of the elements of the supply chain. Its primary focus is to produce the most effective cost and asset infrastructure to support the desired strategic position of the business. It is the heart of the productive engine as well as the source of capacity and efficiency.

- **Customer Targeting** encompasses the large set of activities that are intended to attract, satisfy, and retain the customer. It assures that the customer relationships are managed in the most effective way. Its primary concern is to identify and select attractive customers, and to enhance customer performance, either by contributing to a reduction in the customer’s cost base or by increasing the customer’s revenue stream. The heart of this process is to establish the best revenue infrastructure for the business.

- **Innovation** assures a continuous stream of new products and services to maintain the future viability of the business. It mobilizes all of the creative resources of a firm including the technical, the production, and the marketing capabilities to develop an innovative infrastructure. The heart of this process is the renewal of the business in order to sustain the competitive advantage and its superior financial performance.

Priorities of adaptive processes in each strategic position are different. The following chart (Figure 3.3-2) shows the priority of adaptive processes for each position. The Best Product option needs the lowest cost infrastructure, which originates in the Operational Effectiveness
process. Secondly, it requires the support of a stream of new products to prolong its current vitality into the future. The innovation process gives this. Finally, the Customer Targeting process assures the massive access to distribution channels. Operational effectiveness is the first priority for Best Product positioning.

The Total Customer Solutions position has as its first priority the effective targeting of the customer that identifies the required product bundles and detects the need for customization. Secondly, the Operational Effectiveness process assures the delivery of the products and services to improve customer economics. This option gives innovation a third ranking.

The System Lock-In position has innovation as its leading process to contribute to the creation of the systems architecture that allows the standards to be created and eventually owned. The level of support comes from targeting the systems complementors to consolidate the lock-in position and, quite significantly, the competitors lock-out. Finally in the order of priorities, it is the Operational Effectiveness that is responsible for improving system performance.

Figure 3.3-2 provides the ranking of Adaptive Process priorities with regard to each strategic position.
3.3.6 Application to the Construction Industry

3.3.6.1 Best Product

Firms in this position pursue the best product. The focus is on product or service economy. Porter's generic strategies of cost leadership and differentiation, fall in this positioning. The following are strategies for each position proposed by Warszawski (1996) and others.

Strategy for Cost Leadership:

The essence of this strategy is to be less expensive than competitors in the whole range of a company’s activities. A company usually chooses this strategy when the environment is very competitive and the projects are fairly uniform. Everything is well-defined, and there is little scope for offering competitive value other than cost reduction. A company may also choose this strategy if it feels that it may develop a competitive edge in employing some resources, e.g. a
special construction methods that will allow it to offer a more efficient and less expensive performance. Cost leadership in construction companies can usually be obtained by a combination of the following factors:

- Standardization of products
- Training of personnel
- Tight control
- Careful selection of suppliers
- Technological advancement
- Incentive programs

**Strategy for Differentiation:**

This competitive strategy renders the company’s product more attractive by making it different and more valuable than the competitor’s. The extra value of the product justifies higher prices or increases the scope of sales, or both. There are many possibilities for differentiation in a construction company. Firms might pursue its differentiation strategy by:

- Improving standard of product
- Improving quality of product
- Shortening project completion time
- Extending service to clients

The strategies described above are not always available. Possible strategies vary depending on the nature of the project, which is described by scope of work, organization, contract type, and award. Within general contracting, construction firms likely have to pursue the cost leadership position. On the other hand, contracting methods such as Design-Build (DB), Turn-Key (TK), and Construction Management (CM), likely give firms the differentiation option.

Although some differentiation strategies in the Best Product position look similar to ones of the Total Customer Solutions position, there are fundamental differences between them. Differentiation focuses on product/service economy, and therefore, firms look at internal
activities and improve their internal effectiveness. The Total Customer Solutions position requires firms to take different focal points, with which firms look into customer economics and create the customer value. Further development of the value system in Section 3.1.2, provides us with Figure 3.3-3 showing representative linkage between the firm and other players in the construction industry for Best Product positioning.

![Value Chain Analysis of Best Product Positioning](image)

**Figure 3.3-3: Value Chain Analysis of Best Product Positioning**

### 3.3.6.2 Total Customer Solutions

Researchers in strategic management started to the study of “customers” accompanied by much more sophisticated attention paid to costs in the process of analyzing competitive positioning in an industry. Increased attention to customer analysis involved reconsideration of the idea that the best way to compete was by attaining low costs while offering customers lower prices. As more attention was paid to customers, this led to the generic strategies of cost
leadership and differentiation as proposed by Porter (1980). In addition, Ohmae, then with McKinsey & Company (1982), introduced “cost” and “value,” which is equivalent to Porter’s “cost” and “differentiation.” Those strategic positions have rather limited views in that they mainly focus on internal value chains and not on customer value chains, although Porter, five years later after his “Competitive Strategy” (1980) was published, further developed the differentiation position by looking into customers’ value chains in his second book, “Competitive Advantage” (1985).

Customers are as important to the construction industry as much as in any other industry. Fluor Corporation acknowledges the importance of client relationship. By saying in their annual report that eighty percent of business is derived from repeat clientele. Fluor has strong relationships with other global companies, which drives them to become one of the biggest global E&C firms. Bechtel Corporation sees their customers as the most important factor for them. Their mission statement apparently gives their customers the highest priority.

The Total Customer Solutions position fully focuses on customers’ value chains and their value systems. As previously described, this positioning must be clearly distinguished from the differentiation in Best Product positioning. Apart from differentiation, this position focuses on customer economy more importantly than on product/service economy. This focus involves creating customer value, bonding customers, and offering a customized bundle of products. Early involvement with customers is required, and in doing so, firms can prevent, to some extent, the entrance of other competitors from construction and other industries. E&C firms try to understand the customer economics and pursue cost reduction by changing the customer’s processes and products.

Figure 3.3-4 is an example of a business system, and describes the processes involved in creating a certain types of environments, covering all related businesses and lying across several firms’ domains. We have developed this model from McKinsey’s Business System model and extended it to include other firms’ domains.
In the next figure (Figure 3.3-5), we rotate the above business system arrow and show who operates each function. Although there are many diversified companies covering some functions, we represent typical, narrowly defined, firms in the model. The virtual organization covers all functions and means that the company needs an environment to contain all of necessary activities by itself from project formulation and feasibility study to design, construction, and operation. This is not economically and technically appropriate, so we term it as "virtual."

In the figure, we provide some examples that we term “system integrators,” “integrated consultants,” “integrated A/E firms,” and “integrated contractors.” We distinguish a system integrator from the virtual organization in that the former acts as a coordinator rather than as an individual consultant, A/E, contractor, and so on. Those integrators measure their success according to how much they improve the customer’s bottom line, or, in other words, how they enhance the customer’s economy. Integrators are different from diversified firms in that some large diversified companies can virtually execute all of the functions shown in the figure, although they often act separately, as an A/E to some customers and as contractor to others, while integrators work for the same customers through serving several functions and providing the best customized solution and enhancing total customer’s economy.
The former example describes “vertical” strategy. If there is vertical strategy, there must also be “horizontal.” For example, a large firm’s business, such as an electric company, involves many facilities, which may encompass: a headquarters building; branch office buildings; power plants; distribution facilities such as pipes and towers; regional control offices; research and
development facilities; facilities for employees such as training center and recreational center; and so on. Furthermore, a big plant may also include all kinds of structures such as a tunnel, a dam, and port infrastructures. Horizontally integrated firms can provide a wide range of services to a customer. These services are not the sum of parts but are for synergy among different services so that firms give their customers better solutions and allow growth of a customer’s economy.

Another horizontal scenario depicts an E&C firm starting construction service for a customer whose factory needs continuing expansion or renovation. Over time, the E&C firm decides to set up its office on the customer’s site and gives the customer extensive services, which involves giving advice on possible new facility planning and opinions on overseas manufacturing facilities in the event of transferring its operation overseas.

Figure 3.3-6 shows representative linkage between the firm and other players in the construction industry of the Total Customer Solution position. This figure helps to understand much more robust customer interface, where the interaction between customers and firms is not restricted to ones between sales and procurement, but is extended fully between all functions and activities.
3.3.6.3 System Lock-In

Hax and Wilde (1998) argue that there are two major requirements to achieve the System Lock-In position. One is to obtain a comprehensive integration in an open system among all of the key systems players, and in particular the complementors of the company. The other is to achieve the full ownership of the standard allowing the appropriation of the major share of value created by the system. Not every product or service can be of proprietary standard. However, limited window of opportunity do appear in certain parts of the industry architecture.

Although it is difficult to find an exact analogy, we identify two possible drivers that may lead E&C firms to the System Lock-In position in the construction industry. Those drivers represent rather different types of the System Lock-In position. We term one of them as the “innovation-driven” and the other as the “power-driven.” The former allows that new
innovations put the firm in a proprietary position. The latter one allows that powers such as regulations and policies render the firm a certain monopolistic situation.

3.3.6.3.1 Power-Driven System Lock-In

This position utilizes authoritarian powers outside of a firm and identifies that these powers lie in regulations, policies, and other governmental needs. In Japan’s construction industry, we have seen some examples of the power-driven System Lock-In position.

As we saw through the bilateral trade negotiation between the US and Japan during the late 1980s and the early 1990s, the US sought to change the “designated bidder system” in Japan. In the system, companies were pre-qualified to bid on construction contracts with their status based upon previous domestic performance and financial stature, which virtually retarded foreign competition. The “designated bidder system” not only retarded the foreign firms but also limited competition among Japanese firms.

These governmental policies and regulations, however on the other hand, forced large companies to make joint ventures with small local firms, thus, benefiting and improving economy of these local firms.

These governmental interventions had decreased as we saw in the Announcement of Action Plan by the Japanese government in 1994, which was one example of deregulation and liberalization in the construction industry, providing more opportunities for foreign firms.

Projects governmentally funded often lead to the power-driven System-Lock-In. Japan’s Official Development Assistance (ODA) is now the largest in the world, as reported by the Japan International Cooperation Agency (JICA). ODA consists of: bilateral grants through JICA; bilateral loans through the Overseas Economic Cooperation Fund, Japan (OECF); and contributions and subscriptions to multilateral donor organizations. ODA is mainly used for economic infrastructure – electricity, gas, transportation, telecommunications, or agriculture. Japan’s ODA has often been criticized for its “tying.” Japanese funds required recipient countries to procure products and services from Japan, and thus, called “tied aid.” In such a situation, competition was favorably limited to large Japanese firms. These firms were monopolistically awarded and subsequently enjoyed profits and further opportunities of market development. We regard this situation as the power-driven System Lock-In. The historic developments seen in the designated bidding system reoccurred with ODA. The “tying” is becoming loose. There are
three kinds of conditions on procurement: generally untied; partially untied; and tied. Recently, most aids are generally untied and recipient countries may acquire products and services from other countries. International competitive bidding (ICB) is required. It is reported by OECF that Japanese enterprises win approximately 30% of total contracts. For the rest, developing countries account for 50 to 60% and developed countries for 20%.

The power-driven System Lock-In positioning has played a significant role when the industry is undeveloped and in need of government protection. However, as we have seen, these positions are very vulnerable and uncontrollable for E/C firms.

Figure 3.3-7 shows representative linkage of the power-driven System Lock-In positioning between the firm and other players in the construction industry. This figure helps to understand that there is an authoritarian power in the center of these players.
3.3.6.3.2 Innovation-Driven System Lock-In

The second type of System Lock-In is what we term the “innovation-driven.” Most of the examples that Hax and Wilde (1998) show are categorized in this position. Like Microsoft and Intel, firms have to benefit all complementors to achieve this position and to keep this position through continuous innovations. It is clear that innovation is a primary focal point in this positioning. However, there is one that we should focus on as importantly as innovation, that is bonding.

In the Delta Model, bonding is a primary element in the description of each of the three distinct strategic positions in the business model. Hax and Wilde (1998) term different phases of
bonding in the strategic positions as “bonding continuum.” Firstly, dominant design attracts customers to products or services, which we see in the Best Product position. Secondly, collateral assets surrounding the products or services lock in customers by offering the best solution and rendering high switching costs, which we see in the Total Customer Solutions position. On moving toward the System Lock-In position, firms first, lock out competitors, by controlling the distribution channel, inducing continuous product innovation, and taking advantage of patents. Finally, firms obtain proprietary standard by locking in complementors and customers around the products or services, which we see in the System Lock-In position.

In the construction industry, we observe some attempts to reach the System Lock-In position by innovation. New technical innovation allows firms to lock out competitors and benefits the systems economy attracting customers and complementors. However, this technology often diffuses within the industry or faces substitute technologies. Within the industry, examples of complementors for construction firms are A/E firms, subcontractors, material suppliers, and so on.

Here, we provide examples of the innovation-driven System Lock-In position.

- A patent protects a new innovation for a new type of joint for steel columns and beams. With marketing efforts to A/E firms and contractors, the new joint is now widely used. The joint makes A/E firms’ design work easy and allows contractors to shorten their schedule and reduce related labor costs. Those situations further promote the use of the joint. This positive feedback loop allows the firm to reap the proprietary profits. However, the firm does not continue to improve on the patent, and soon other firms start offering substitutes. Thusly, the joint becomes obsolete. Many innovations in the industry similarly follow such a short product life cycle and therefore rarely lead innovators to the System Lock-In position.

- Another example is of a construction firm’s technology, related to clean room design and construction is being one of its competitive advantages. The firm developed this technology not only in its R&D facility, but also together with its many complementors’ R&D departments. Complementors include: material firms such as tiles, sealing, flooring, and paint; and mechanical and electrical engineering firms. The construction firm knows the system or the combination of all the materials and
technologies. This method involves a systematic combination of newly developed materials and design concepts, provided by other firms. Along with the increase of clean room requirements by the semiconductor industry, there have been incremental improvements, which raised entrance barriers for competitors and retarded imitation. As long as needs and quality requirements of clean rooms increases along with the demands on semiconductors, the firm probably would appropriate the rent and possibly reach the innovation-driven System Lock-In in this relatively small part of the industry.

The following Figure 3.3-8 shows representative linkage between the firm and other players of the innovation-driven System Lock-In position in the construction industry. This figure helps us to understand that there is one innovative firm in the center of all players.
We have observed another unique and systematic attempt by a Japanese firm to reach this position, by utilizing an automatic building system. The system was developed for a condominium project in Japan, then was used on two projects in Japan, and is now applied in Singapore, which suffers a similar labor shortage as Japan. If the firm can form relationships with complementors around this system and achieve the desirable system economy, it will be successful in reaching the System Lock-In position.

In the industry, we often refer to technological issues only, when discussing innovation. However, there are many fields of new innovation in the industry in addition to that of technological fields. Johnston and Marceau (1995) studied construction technology research climate in the US, and identified primary fields. They separated R&D activities into seven areas: geo-environment/water resource; materials; structures; construction; infrastructure; energy; and lastly, other. Furthermore, they identified six categories in construction: management (e.g. financial and marketing); process design (e.g. planning, scheduling, constructability, and productivity); resources (e.g. materials & equipment management, human resource management, and safety); contracts (e.g. estimating, bidding, negotiation, specification, and claims); operations (e.g. means & methods, automation, temporary works, robotics, and tools & equipment development); and lastly, other.

We have previously discussed how some regulations can lead firms to the System Lock-In position. As we have seen, there is a tendency towards deregulation, and firms that heavily rely on present regulations, could jeopardize their future. In spite of this general tendency towards deregulation, some areas of the industry are expected to face an increase of regulatory action. Yates (1994) conducted research on regulations that might affect the construction industry, and according to his research, potential areas that face increased regulatory action are those of worker safety and environmental issues. We believe that there are many opportunities to reach a competitive position by combining regulation and innovation in these two areas.
CHAPTER 4

FRAMEWORK FOR STRATEGIC THINKING

Only static frameworks have been discussed in the construction industry, as found in the literature review in Section 2.3. Conventional strategic thinking works well so far, but it has difficulty in capturing the dynamic aspect of businesses. Specifically, it is found that, when construction firms consider global business, they face varying developmental stages in each country, and also varying developmental stages of the construction industry. The current needs of globalization drive firms to attain dynamics of strategic thinking.

4.1 Purpose of the Proposed Framework

The proposed Framework enables a firm to perform strategic thinking in a constructive way toward the future rather than follow the market, and leads the firm to adaptive processes in the direction of choice pursuant to their strategic positioning.

Much research has been conducted on strategic planning concerning the global market. Specifically, these areas include: modes of entry; legal issues; financial issues; operational issues; and market analysis. Interestingly, none of these provides a fundamental framework for strategic thinking. We consider that many findings in these areas are tools or means, and rather, what firms need now, is to know how to use those tools, that is, a framework for strategic thinking.

4.2 Basic Framework for Strategic Analysis

Strategy is needed in order for an organization to obtain a viable match between their external environment and their internal capabilities. From this perspective, emerges the fundamental framework of business strategy with three areas of attention: the business unit, as the central subject of analysis; the industry structure, which determines the key environmental trends; and the internal competencies, which define the ways to compete. Figure 4.2-1 illustrates how these three areas of attention provide the framing of the strategic issues for a business, and how they become the key forces determining strategy formulation and implementation.
A formal planning process should recognize the different roles to be played by the various managers of a firm in the formulation and execution of their firm's strategy. There are three basic perspectives that have always been identified as the essential dimensions of any formal planning process: corporate; business; and functional. Alignment of those perspectives is very important for all firms.

In our model, we do not clearly distinguish these three areas. While our model is the best fit for the business level, the model can also be applicable to the corporate and functional levels. We started with the business level, but by taking into consideration the importance of alignment of three levels, the model has begun to cover not only the business level, but also the corporate and functional levels.

![Figure 4.2-1 Basic Framework for Strategic Thinking]

**4.3 Analysis of the Three Strategic Frameworks**

**4.3.1 Porter Model**

We have reviewed the Porter Model in the previous chapter, encompassing its basic analytical tools of: five-forces analysis; generic strategies; value chain analysis; and so on.
These tools virtually compose all elements of the basic framework that we have thus far covered in the previous section. The five-forces analysis is for environmental scan. The value chain analysis is for internal scrutiny. The generic strategies give a firm a broad direction in the strategy formulation stage. However, we can identify several weaknesses with the Porter Model:

- The model thoroughly reviews the industry, but not the firm
- The five-forces analysis does not distinguish between the industry’s attractiveness for incumbents versus entrants
- The value chain analysis tends to be only an external view of the firm’s activities
- The five-forces analysis does not weight the “forces”
- The generic strategies are too generic
- The model lacks a view for positioning
- The model cannot capture the industry change
- The model fails to consider a timeframe
- The model lacks the mechanism to incorporate a long-term vision
- Strategies formulated from the model present a short-term view

The model leads the firm to focus on its operational effectiveness, whether it takes a position of cost leadership or differentiation. As we have seen in Section 2.2, the model has been criticized for its conclusions when it is seen that firms using the cost minimization strategies have reduced their ability to make innovative changes or to respond to those introduced by competitors.

Considering the above weaknesses, we summarize that the Porter Model is a powerful tool both for industry analysis (the “external environment”) and the external analysis of a firm (the “internal environment”), only in a current situation. However, the model is not sufficient for analyzing the more internal view of the firm, capturing industry changes, seeking for a long-term vision, and providing action programs.

4.3.2 Resource-Based View

The Resource-Based View (RBV) attacked the idea of the strategic business unit (SBU) and looked at the firm’s specific competencies shared through the firm. Prahalad and Hamel
(1990), with their influential article, were among those who criticized the SBU-based strategic formulation. However, many RBV theorists agree with the validity of the business level use of the RBV. Among them, Peteraf (1993) proposed the use of the RBV for both corporate and business levels.

We consider that the RBV is useful for both business and corporate levels and that the RBV allows managers to think not only of their business levels but also of corporate levels. In other words, the RBV enables managers to capture their business level strategy in the context of corporate level strategy. The RBV model gives a through internal view of the firm and business and gives a long-term view for the future of that firm and business.

However, we can identify several weaknesses for the stand-alone use of the model as a strategic thinking framework. The model ignores the industry and does not provide mechanisms to view the industry or market:

- The model looks only internally and does not consider the industry
- Uniqueness, sustainability, appropriability and opportunism must be considered to be valid in an industry context, although there is no mechanism to view the industry through the model
- The model lacks a view for positioning
- It is hard to formulate a strategy from the model
- The model ignores industry and business results in the market
- The model is elusive and hard to use for the analysis of the firm

Having understood these weaknesses, we can now summarize that the Resource-Based View is a powerful framework for the internal analysis of each firm, as it reviews its core competency in its current situation, and its account of competitive strengths. In addition, it allows firms to seek a long-term vision and to link the business and corporate level strategies. However, it is not sufficient for analyzing the industry or market, capturing industry changes, positioning its strategic direction, and providing action programs.
4.3.3 Delta Model

The Delta Model is a relatively new framework compared with the previous two, and is a powerful tool capturing changes and dynamics of the industry. The triangle gives firms more choices of strategic positioning than the generic strategies espoused by Porter and links the choice of a strategy to the succeeding execution programs or adaptive processes.

However, the model is not comprehensive for stand-alone use as a strategic thinking framework and, although literature is sparse, we can identify, through our use of the model, several weaknesses:

- There is no mechanism for industry analysis
- There is no mechanism for internal scrutiny
- There are no criteria to choose one of the three positionings

Among these frameworks (the Porter Model, the RBV, and the Delta Model), only the Porter Model covers all parts of elements of the basic framework. However, as we have previously analyzed, the model is insufficient in internal scrutiny and strategic positioning. By employing other two models, the RBV and the Delta Model, their combined use complements the weaker areas within the Porter Model. The following section covers this relationship of utilizing all three models.

4.4 Integration of the Three Models

4.4.1 Integration of the Three Models

In the following sections, we propose an iterative approach to strategic thinking that builds upon the principal of a dynamic marketplace, considering the basic framework for strategic thinking along with results of analyzing the three models.

Most critical in determining an appropriate strategy for a firm is the analysis of the environment, internal and external, in which the firm exists. Porter’s five-forces and value chain analyses offer a perspective on the industry and the internal environment. The Resource-Based View of the firm offers an introspective view of the firm’s resources, focusing on the evidence of uniqueness, sustainability, appropriability, and opportunism.
Reflecting that which has been understood from the careful and detailed analysis of industry and firms, strategy is devised as positioning within a triangle of options. This triangle (the Delta Model) enables the firm to choose a Best Product, Total Customer Solutions, or System Lock-In strategy with the appropriate adaptive processes and performance metrics.

The critical understanding lies in the realization of the need for an iterative approach to strategic thinking in which the inherent dynamism of the environment, internal and external, is understood to be unavoidable. This leads to the simple but powerful notion of iterative analysis in which the three models are used in sequence and the analysis iterates constantly to expose strategic weaknesses brought on by the inherent dynamism.

4.4.2 The Proposed Framework

The following is the abstract of our proposed Framework for strategic thinking. To address this Framework, we have to separate it into two parts, the iterative approach and the circular dynamic. These two parts are described following the abstract of the proposed Framework.

The firm has resources either tangible or intangible. These resources are a source of competitive advantage if four conditions are met: uniqueness; sustainability; appropriability; and opportunism/timing. Those resources become the core competency of the firm. On understanding its competency, the firm chooses where to compete by analyzing the industry forces and chooses how to compete by determining competitive positioning, such as cost leadership and differentiation, as suggested by the Porter Model. The Delta Model gives more choices for positioning including the Porter’s positions and leads the firm to the adaptive processes following the selection of positioning. The adaptive processes will utilize the firm’s resources and/or acquire new resources, and this process will further change (strengthen or weaken) the core competency of the firm. While understanding the dynamics between resources, industry (market), and positioning, the firm has to choose the market and its positioning to strengthen its competence for a sustainable competitive advantage to achieve its goals or mission. The next figure shows interactions among resources, industry (market), and positioning (Figure 4.4-1).
4.4.3 The Iterative Approach

Here we describe the first part of our strategic thinking Framework. To address the strengths and weaknesses of the three models and get the whole structure that at least satisfies the fundamental elements of the basic framework, we structure the iterative approach. The approach is composed of four stages: mission; the Resource-Based View; Porter Model; and finally Delta Model. See Figure 4.4-2.

Although we try to propose the systematic framework, given that our Framework incorporates a conceptual model such as the RBV and roughly covers corporate level to functional level, we can only provide the Framework conceptually.
Stage 1 – Mission

- A firm seeks for alignment and integration of the factor-view and product/market-view.

First, firms have to start on their missions. Missions are the driver for all activities of the firm and business and we must distinguish two different levels of missions, corporate level and business level. In general, corporate mission is long-term, and business, short-term. Since our Framework is the most appropriate for the use of strategic thinking for the business level, the mission in this stage is business level. The Business mission must be derived from the corporate mission and must match the current market requirements. The business mission aligns and integrates the factor-view and product/market-view. The former is for a long-term view, seeking for core competency such as resources and capabilities, and the latter is for a short-term view, focusing on business scopes such as product, market, and geographic. Requirements of such alignment of factor- and product/market views imply that we can reach the integration and
congruence of two views by conducting both of the next following models, the Porter Model and the RBV. The Porter Model allows the firm to analyze the business scope and the RBV gives deep thoughts on a core competency to a long-term view. The mission is the initial point, but is also a conclusion of the analysis of the Porter Model and the RBV, the steps following the mission stage. This paradoxical requirement implies a need for a feedback system, discussed in the next section as a circular dynamic.

Stage 2 - Resource Based View

“What does the firm have?” and “What does it need?” can be answered based on the Resource-Based View, as follows:

- Assess resources, which the firm has and which the firm will need
- Analyze competitive strengths or competitive advantages
- Focus on unique competencies, sustainability, appropriability and opportunism/timing to determine whether resources that they already have or will have will lead to a competitive advantage
- Assess current business and core competencies by employing the RBV’s view on how the business utilizes its core competency
- Assess its business employing the RBV as to how the business will affect its core competency and what business the firm will need for its core competency development

Stage 3 - Porter Model

“Where to compete?” and “How is the market?” can be answered for the firm, according to the Porter Model, as follows:

- Assess where to compete and how to analyze the market
- Use a segmentation matrix to find where to compete specifically
- Use the five-forces analysis to determine attractiveness of the industry segment
- Become acutely aware of competitors, potential substitute, supply chain, customer needs, and new entry
• Analyze the internal environment of itself and competitors by the value chain analysis
• Analyze how activities are coordinated and configured in the global setting

Stage 4 - The Delta Model

The Delta Model answers the questions, “How to compete?” and “What to do?” by suggesting:

• Plan how to compete and what to do
• Evaluate positioning within the industry
• Select a path to sustainable and superior financial returns through a Best Product, Total Customer Solution, or System Lock-In Strategy
• Determine appropriate adaptive processes and performance metrics
• Look forward to improving positioning based upon Stage 2 and 3 analysis

4.4.4 The Relationship between the Iterative Approach and the Basic Framework

We now analyze the relationship between the basic framework, described in Section 4.2, and the iterative approach in the previous section. The Resource-Based View reveals resources that the firm has and needs to build. This leads to the mission of the firm or business while provoking internal scrutiny. The tools of the Porter Model function as follows: the five-forces analysis is for the environmental scan; the value chain provokes internal scrutiny; and these two with the generic strategies give the firm basic strategic direction. Finally, the Delta Model analyzes the positioning of the firm as well as competitors in the industry. The Delta Model with its adaptive processes gives the firm dynamic positioning strategy, which can aid the firm in building its core competencies for sustainable competitive advantages with the added assistance of the Resource-Based View.

Figure 4.4-3 shows the relationship of the basic framework (the formal processes) and the three strategic analysis models (the Porter Model, Resource-Based View, and Delta Model). Different dotted lines show the contribution of each of the three models to the elements of the basic framework, although the three models interact with each other more than the figure inherently shows and cover a wider perspective than is actually revealed.
4.4.5 The Circular Dynamic

In as much as the iterative approach addresses the inherent weaknesses of the Porter Model and Resource-Based View, the problem of dynamism and change remain. Each model captures the state of the firm at a moment in “industry time.” As industry dynamics change, the model must be reevaluated to incorporate the result of the dynamic. The Delta Model succeeds most effectively at capturing the dynamics of change because it captures the learning from the Porter Model and Resource-Based View. As for the paradoxical procedure between the mission and the Porter Model/ RBV that we have discussed in the earlier section, the circular procedure gives the solution. To address the problem of dynamism and contradiction, a simple circular dynamic to the analysis and modeling approach is suggested. Figure 4.4-4 shows the conceptual framework of the circular dynamic.
The crucial insight from the circular dynamic is the necessity for constant iteration and reevaluation of the industry, the firm and the strategy. Constant reevaluation ensures that changes in the environment are not only addressed but also occasionally anticipated and strategies formulated, sometimes in advance and in anticipation of the inevitable cycle of change.

4.4.6 Portfolio Management through the Circular Dynamic

Portfolio management is a critical issue for corporate level strategy, but is also important for business level strategy. It is reasonable to say that business strategy is a set of smaller segments within the business. This notion allows us to discuss the portfolio issue, although further details on this matter are not included within the scope of this paper.
Portfolio management was once a center of criticism for its responsibility of narrowing the manager’s mindset into focusing the short-term profitability. This criticism is still true when the firm uses the portfolio management only in the paradigm of “industry structure – competitive positioning,” which is most likely urged by the stand-alone use of the Porter Model.

The Delta model gives firms three choices of strategic positioning. Different strategic positioning leads to a different adaptive process. Each adaptive process emphasizes a different functionality of the firm’s activities. This requires the firm to allocate their resources depending on their choice of position, which will likely follow the same path of criticized portfolio management. However, our model has incorporated the “Resource-Based View” paradigm, which helps the firm to avoid falling into a trap of mere monetary resource optimization.

Some firms might prefer to concentrate on one of three positions. However, too much focus on one position makes the firm vulnerable to industry changes. When industry changes, the firm will suffer loss. In the global market, firms might prefer to take more than one position, whereas in the domestic market, firms may prefer to take only one position.

Balancing these discussed issues of positioning, core competency, and resource optimization in the changing world is not an easy task, but our circular model shows the firms mechanism of strategic thinking.

4.5 Hypothesis

We have proposed a Framework for strategic thinking with both the “iterative approach” and a more dynamic approach, the “circular dynamic.” The proposed Framework theoretically unifies both short-term and long-term visions. Therefore, our proposition is:

“If it follows this proposed Framework, a firm can devise strategy which allows it to achieve above-average performance and to sustain its competitive position in its industry or business.”

Within the provided timeframe, it is difficult for us to prove the above proposition. Instead, we have made a hypothesis:

“A firm that has succeeded and sustained its position in the industry or business, appears to have followed the same path the proposed Framework would suggest.”

If we can prove our hypothesis, we can prove the validity of the Framework. Utilizing several case studies, we examine our hypothesis in the next chapter.
CHAPTER 5

APPLICATION OF THE FRAMEWORK TO A JAPANESE CONSTRUCTION COMPANY

In this chapter, case studies are conducted on a real Japanese construction firm, as opposed to our previous theoretical firm. First, we study the overall business and history of the corporation, and its corporate level mission. Then, we will look into its business level operations. Since this paper focuses on the business in the global market, the foreign business of the corporation is discussed.

5.1 Large-Scale Japanese Construction Firms

Large-scale Japanese construction firms are vertically integrated; and therefore, strategies for them are different from other small-scale firms. The value chain of a vertically integrated engineering and construction (E&C) firm is shown in Figure 5.1-1.

![Figure 5.1-1: Value Chain of Integrated Firm](image-url)

Figure 5.1-1: Value Chain of Integrated Firm
5.2 Obayashi Corporation

Obayashi Corporation is one of the Japanese vertically integrated large-scale construction firms. Obayashi numbers among the world’s leading general contractors and among the top five in Japan. Obayashi is equipped to implement each phase of virtually all types of construction projects and can act as consultant, systems designer, engineer, or architect. It can conduct feasibility studies, perform research and analysis, build virtually any structure, plan and implement civil engineering and heavy construction, plan and execute building renewal projects, and provide post-construction maintenance. Obayashi has a head office, a main office, 9 branches, 79 business offices, a technical research institute, two machinery works, and 26 subsidiaries in Japan. It has 19 branches and 14 subsidiaries overseas. As of July 23, 1997, Obayashi has 12,014 employees, including 879 architects, 3,512 construction engineers, 1,972 civil engineers, 235 research scientists and technicians, 97 computer systems engineers, 1,682 other technicians, and 3,637 support staff. The following is an expert from Obayashi’s 1997 annual report, describing their business:

1. Contracting for construction work.
2. Regional, urban, oceanic, and environmental development; other business relating to construction.
3. Engineering, managing, and consulting related to the preceding two items, including research, planning, designing, and supervising.
4. Housing business.
5. Sale, purchase, exchange, lease, brokering, owner-ship, caretaking and utilization of real estate.
6. Manufacture, supply, sale, and lease of construction machinery and equipment, and materials and equipment for temporary work.
7. Manufacture and sale of concrete products for construction, fireproof or nonflammable building materials, materials for construction, materials for the interior and exterior of buildings, furniture and wooden products for buildings, and sale of heavy construction and building materials.
8. Maintenance and care of buildings and related facilities; security and guard services.
9. Acquisition, development, licensing for use, and sale of software industrial properties and providing know-how related to the utilization of computers.

10. Information processing services; providing information and supply of telecommunication circuits.

11. Sale, lease, and maintenance of electronic office machinery and equipment, including computers.

12. Management of health, medical, athletic and leisure facilities, hotels and restaurants, and travel agencies.

13. Operation of insurance agencies under the Automobile Accident Compensation Security Act and of non-life insurance agencies.


15. Loans, guarantees, and other financial activities.

16. Activities related to any of the preceding items.

5.3 Company History

In this section, we study the overall history of the corporation because of its importance to strategic thinking. As Leonard-Barton (1992) argues, the capability development is path-dependent. In addition, the process of strategic formulation is also often path-dependent and can be viewed in the following excerpt from Obayashi Corporation’s 1998 annual report.

1892: Yoshigoro Ohbayashi, a founder, opened a small construction shop in Osaka, taking advantage of the first wave of Japanese modernization. In 1898, he and a partner, Kamezo Shirasugi, laid the foundation of today’s Obayashi Corporation.

1901: Obayashi won its first major contract, to construct the grounds and buildings for Osaka’s Fifth National Industry Fair. The Russo-Japanese war brought contracts for hospitals and barracks. In fact, the young Obayashi Corporation built 100 barracks in just three weeks. This feat was rewarded with a contract to build one of Tokyo’s most enduring landmarks, Tokyo Station. Completed in 1914, the railway station withstood the Great Kanto Earthquake of 1923, testifying to the quality and durability of Obayashi’s work.

1920: In the early 1920s, the Fluor Company of the United States invited Obayashi executives to America to study its advanced construction technology. This planted the seed for technology transfer and international activities, which are still bearing rich fruit today.
Obayashi constructed three major buildings about this time: the Mainichi Newspaper office, the Merchant Marine Kobe Branch building, and the Sumitomo building.

After the 1923 earthquake and firestorm leveled much of Tokyo, Obayashi clients insisted on fire-proof, quake-resistant, reinforced concrete buildings. Thanks to technology learned from Fluor, Obayashi was ideally situated to take advantage of the post-quake building boom.

1950: While the years following World War II were slack ones for the construction industry, the onset of the Korean conflict in the early 1950s brought increased demand in both public and private sectors. The company won contracts for the Japan Broadcasting Corporation building and the Tokyo Station annex, as well as the first of 50 major dam projects in Japan and abroad.

1960: The 1960s saw Obayashi step up the pace of technological development. Japan’s construction industry lacked R&D facilities. In fact, Obayashi was the first construction company in Japan to establish an internal Technical Research Institute, and among the first in the world to do so.

The OWS-Soletanche Diaphragm Wall Construction Method was one of the first fruits of the Technical Research Institute, a technology that is still a mainstay today. Obayashi used it first in construction of the New Osaka building in late 1961, and fine-tuned and adapted it to a variety of applications since.

Obayashi’s first major overseas civil engineering project began in 1965 as Singapore’s massive land reclamation projects got under way. They developed quiet non-polluting continuous excavation techniques for the project that were used throughout the reclamation scheme, which finally came to a close in 1997 after 1,540 hectares - 2.6% of Singapore’s land mass - had been reclaimed from the sea.

Japan’s bullet train, the Shinkansen, made its first run in 1964, over tracks and through stations built by Obayashi. Obayashi completed Japan’s first high-rise building, the 21-story Hotel Empire in Yokohama, in 1965.

Obayashi’s first overseas office opened in Thailand in 1964, followed quickly by others in Singapore, Indonesia, and Hawaii, U.S.A., as their international presence grew.

1970: Osaka’s Expo ’70, which showcased their roof lift-up method and air-membrane dome construction, launched a decade of technological accomplishments. Obayashi adapted
high-rise building techniques to Japan's unique conditions, refined their shield tunneling methods, and began planning the main building of the Technical Research Institute. After the oil crises hit in 1973 and 1979, energy efficiency became ever more important. Their energy-efficient technology, highlighted in their own headquarters in Osaka, was completed in 1978. Today, it is still one of the most energy-efficient high-rise buildings in Japan.

The 1970s saw Japan embark on the massive highway-building program that continues today. Obayashi has played key roles in building every major expressway in Japan, and still continues to do so.

Overseas, Obayashi established their Indonesian subsidiary in 1972, and became the first Japanese construction company to win a public works project in the United States in 1979.

1980: With the 1980s, Obayashi Corporation entered its tenth decade. The Technical Research Institute — housed in the world's most energy-efficient building is the most comprehensive in the industry. Its laboratories for concrete and soil experimentation are the largest and best equipped in Asia.

Thousands of projects were completed during the decade, ranging from the delicate restoration of national cultural treasures like the Katsura Rikyu Detached Palace, to precision testing of giant pre-stressed concrete containment vessel (PCCV) models for nuclear power projects, to building highways and railways, and to playing a major construction role at Tsukuba Expo '85, Japan's stunning showcase of science and technology.

In 1984, Obayashi celebrated 20 years in business overseas. With more than a century of experience in building construction and civil engineering, Obayashi has much to offer international clients, partners, and friends.

1990: In 1991, Obayashi Corporation celebrated its centennial year. Early in the decade, their OWS-Soletanche Diaphragm Wall Construction Method reached an accumulative record of 3 million square meters. Robots came into the construction industry as Obayashi perfected its Automated Building Construction System (ABCS) and Big-Canopy method of constructing high-rise steel and reinforced concrete buildings with robots, automated equipment, computer control systems, and prefabricated components.

The decade also saw Obayashi design and build the Osaka Dome multipurpose arena and make a major contribution to the construction of Kansai International Airport, Japan's only 24-hour sky harbor. The final mammoth project of the 1990s, the trans-Tokyo Bay Aqualine, now
nears completion. The mole they used for the Aqualine tunnel was the largest diameter shield machine the world has ever known. Earth balance and slurry shield tunneling are an Obayashi forte. To date, their moles have chewed through hundreds of kilometers of earth to make tunnels for subways, highways, sewer mains, storm drains, runoff storage, and multipurpose utility bores.

5.4 Mission Statement

Obayashi’s mission statement reads “Our primary raison d’être is to improve global standards of living while contributing to the advancement of society and development of the world. In order to do this, we must:

1. Refine our creativity and perceptions; then call on the accumulated technology and wisdom of the company to add new value to the concept of space.
2. Expand our individuality; yet respect human frailties.
3. Stay in harmony with nature; blend in with local societies: and put our hearts into creating a more vibrant, richer culture.”

Compared with Obayashi’s mission statement, we examine several firms’ mission statements including: Bechtel Group; Fluor Corporation; Kajima Corporation; Kumagai Gumi Corporation; Taisei Corporation; Takenaka Corporation; and Shimizu Corporation. See Figure 5.4-1 on the following pages.

As argued by Kotler (1997), good mission statements have three major characteristics: focusing on a limited number of goals; stressing major policies and values; and defining the major competitive scopes. These characteristics envelope industry, products and applications, competence, market-segment, vertical, and geographical scopes. Most of the Japanese firms, as well as Obayashi Corporation, emphasize contributing to society, technology, and environment. Compared to the ideal model of mission statements, these statements are very vague and encompass difficulties in that some concepts are likely to contradict business that is conducted on a daily basis, and are hardly instructional to managers, although they may give some sense of policies and values to shareholders, employees, suppliers, and customers. On the other hand, US firms such as Bechtel and Fluor Corporation clearly give priority to customers and serve their
customers with the best solutions by using primarily competency of technology. Although these mission statements are still vague, managers are still able to derive direction from them.

The ambiguity of corporate mission statements of Japanese firms drives us to further investigate them. In the annual report of 1998, Obayashi claimed that they would continue their basic research in a variety of areas, and also put effort on new information technology for marketing and operational purposes. Moreover, they are aiming at reducing the environmental impact of their activities while striving to design and engineer their projects for greater efficiency. In the past, they had been choosing volume at the expense of profit margins. They are now considering profitability with more attention to cost reduction along with advanced technology and the global environment. Although our investigation found another goal, which is the cost reduction through their technology, it is hardly instructional to managers. We infer that one possible reason for this ambiguity and contradiction would account for the diversity of the firms, which allows them to conceive various values and policies. Further investigation on this issue is beyond the scope of this thesis.

We list here key phrases used in the Obayashi's corporate mission: contribution to society; use of technology; care of environment; cost reduction; and profitability. Our review now moves toward the business level mission, which has to harmoniously co-exist with the corporate mission. In the following sections, we examine what mission the business has, how managers understand the corporate mission, and how they incorporate it into their business mission.
<table>
<thead>
<tr>
<th>Company</th>
<th>Mission Statement</th>
</tr>
</thead>
</table>
| Obayashi Corporation | “Our primary raison d’être is to improve global standards of living while contributing to the advancement of society and development of the world. In order to do this, we must:
1. Refine our creativity and perceptions; then call on the accumulated technology and wisdom of the company to add new value to the concept of space.
2. Expand our individuality; yet respect human frailties.
3. Stay in harmony with nature; blend in with local society; and put our hearts into creating a more vibrant, richer culture.” |
| Bechtel Group      | “We will be the engineer-constructor of choice for customers, employees, and key suppliers in every industry market we serve by: delivering exceptional value to our customers, earning a fair return on our delivered value, and working closely with our customers, key suppliers and communities to help improve the standard of living and quality of life.” |
| Fluor Corporation  | “As Fluor Daniel employees, our mission is to assist clients in attaining a competitive advantage by delivering quality services of unmatched value.”                                                                                                                                                                                                       |
| Shimizu Corporation | Shimizu Corporation’s mission ranks priorities as: contributing to society; respecting humanity; seeking for innovation; serving the customers; and finally keeping their zeal.                                                                                                                                                                                                  |

Figure 5.4-1: Corporate Missions (Continued)
<table>
<thead>
<tr>
<th>Company</th>
<th>Mission Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taisei Corporation</td>
<td>Taisei Corporation’s mission is to create a vibrant environment for citizens by achieving client satisfaction, pioneering in creating new value, respecting differences and respecting the relationship of human and nature.</td>
</tr>
<tr>
<td>Kajima Corporation</td>
<td>“Kajima applies its strong single source approach and broad range of technical capabilities to ensure the best possible solutions, ones that successfully meet the Owner’s functional, aesthetic and budgetary objectives.”</td>
</tr>
<tr>
<td>Kumagai Gumi Corporation</td>
<td>Kumagai Gumi Corporation sets three principles as Corporate Precepts: trust, to develop client trust and confidence; consistency, to be consistently professional and responsible; and cooperation, to promote cooperation and mutual prosperity. In addition, they set four goals to improve and contribute to: environment; clients; staff; and reputation.</td>
</tr>
<tr>
<td>Takenaka Corporation</td>
<td>Takenaka Corporation defines its philosophy as a contribution to society by advancement of technology, globalization, and diversification.</td>
</tr>
</tbody>
</table>

Figure 5.4-1: Corporate Missions
5.5 Case 1: Application of the Framework to the US Market (Public Sector)

Before applying the proposed Framework, we have to specifically define the targeted market or business segment. Here, we select an actual public project in Boston as a case study, specifically a highway project in the metro area.

For our studies, we have interviewed a manager of Obayashi. See Section 5.5.6 and Appendix 3 for details of the interview.

5.5.1 Project Description

The Central Artery/Tunnel Project is the most complex, ambitious, and technically challenging highway project ever undertaken in the US. Beneath one of America’s oldest cities, this project is replacing Boston’s aging, six-lane elevated Central Artery (I-93) with a modern eight-to-ten-lane underground expressway while keeping the old artery and all surface roads open, rebuilding five major highway interchanges that serve as crossroads for eastern New England.

The owner of the project is Massachusetts Highway Department (MHD). Bechtel and Parsons Brinckerhoff are serving as construction manager (CM) and the project was divided into several parts for design and construction. Obayashi Corporation is now working on portions as a contractor on the project.

5.5.2 Resource-Based View

In contrast to the Porter Model, which takes an outward look at the industry in general and the competitive landscape in particular, the Resource-Based View of the Firm primarily looks inward. The model’s objective is to determine whether the unique competencies of the firm (or business unit) translate into a superior resource position and, ultimately, to a competitive advantage.

Having analyzed each of the elements of competitive advantage offered in the Resource-Based View model, we conclude that Obayashi Corporation has a variety of internal assets, mostly intangible, that translate into a competitive advantage.
5.5.2.1 Elements of Competitive Advantage

We now examine the specific elements of competitive analysis that lead us to the qualified conclusion that Obayashi’s unique competencies yield a superior resource position. Elements are now summarized in detail.

5.5.2.2 Unique Competencies

Unique competencies develop through internal resources and capabilities. Competitive advantage results if these competencies are difficult to imitate. Given the nature of the construction service, it is not surprising that Obayashi’s primary competencies are intangible.

The firm is one of the Japan’s oldest construction companies, founded in 1892. Since then, conducting business through several wars in the early 1900s and the Great Earthquake in Tokyo in the 1920s, the firm contributed to Japanese society. The firm played a significant role in the reestablishment of Japan after World War II and in the 1950s. Having established its own R&D in the 1960s, the firm contributed to improving infrastructures and buildings with its technology. This long history has established the firm’s reputation and brand.

Since having learnt technology from Fluor Corporation in the 1920s and establishing its R&D in the 1960s, the firm has improved and developed its production technology. Now, it owns a significant number of patents, which are reported at 1,800 in an internal corporate magazine of 1997. In addition, the firm has various technological knowledge intangibly within the organization. Although the size of the firm and its large overhead seem to slow its promptness in response to customers’ needs, the firm still maintains a quick response time due to its flexible culture. Through its long history and its size, the firm has accumulated technological knowledge, and learning and experience within. Most of its knowledge is historically and intangibly developed within its corporate culture and employees. Since they understand their employees are the keepers of company assets, they treat employees with special care. The firm hires top graduates from all over the country and educates them through its unique on-the-job training system.

Like other industries, over time, the firm has developed strong relationships with customers, and these relationships now count for a competitive advantage. Although many Japanese companies have been suffering while trying to reduce bad debts after the bubble burst, the firm, thanks to having focused on its main stream of business instead of investing in other
areas, now is benefiting from its sound financial structure. In answering to escalating customer needs and required operational efficiency, the firm has incorporated many capabilities from its value chain and now is fully vertically integrated.

In summary of the above discussion, we list Obayashi’s competencies:

- Patents
- Brands
- Company reputation
- Culture
- Market share
- Firm size
- Financial resources
- Production technology
- Technological knowledge
- Accumulated learning and experience
- High-level quality management
- Vertical integration
- Strong customer relationship

### 5.5.2.3 Sustainability

In order for a competitive advantage to be sustainable, the firm must preserve these conditions of uniqueness.

Some competencies such as brand and reputation have been developed over the time and will likely remain sustainable, as long as the firm keeps its culture, described as challenging, customer-oriented, and flexible. In addition, technological knowledge, and learning and experience, have been embedded within the culture and the employees. Those resources that are embedded within the organization are likely protected from imitation because of its causal ambiguity. However, we strongly suggest that these competencies be embedded within the firm’s culture and among employees rather than being clearly identified with specific individuals and specific technology.
Technologies can be defined as sets of knowledge or factors according to Dosi (1982). In general, we may say that technology in the construction industry tends to consist of components of low-profile technology from various fields that are not high-tech. Thus, these technologies will likely face the risk of being replaced with substitutes and of being imitated. However, if those technologies are scattered throughout the R&D and the firm, and if complementary assets in marketing, distribution, operation, and so on, are also scattered throughout its value chain, those technologies then become more causally-ambiguous and difficult to imitate. Obayashi’s flexible culture and diversity of research fields make it possible for them to respond to the customer’s needs quicker than others by composing many areas of technologies. According to the above discussion, we suggest that technology not be specifically readily identified but intangibly embedded within culture, and that, more importantly, the firm improve its implementation process within or across the organization. Moreover, we suggest that the firm keep upgrading its technologies so that competitors cannot follow them.

From the field of technology strategy, Winter (1987) has argued that an organization’s knowledge can be sustainable if the knowledge is tacit rather than articulable, if the knowledge is not observable in use, and if the knowledge is complex rather than simple. We have found that these criteria are very appropriate to managing sustainability of technologies, technological knowledge, and experience in the construction industry.

Our investigation of the firm concludes that it has many intangible resources that are difficult to imitate, and we, however, suggest that the firm strategically accumulate and enhance those resources and embed them within the organization to keep them sustainable.

5.5.2.4 Appropriability

Obayashi’s competencies are both unique and sustainable and have led to the creation of significant economic value. While the question of whether Obayashi has created economic value is trivial, the question of its appropriability of that value is still open.

It appears that Obayashi’s reputation, brand, strong customer relationship, and image in providing high quality buildings and infrastructures allows the firm to attract, serve, and retain customers seeking better services. Because Obayashi owns its technological knowledge and accumulated learning and experience and has the strong relationship with suppliers and subcontractors, we feel that it can appropriate the value it creates for its customers.
However, there is still a question of whether Obayashi can appropriate the value created by technology developed through its R&D. It is true that technology creates the value for the customer, and consequently attracts them, but, due to fierce competition, it is likely that Obayashi cannot appropriate the value and just gives it away to its customers. This most likely happens when technology is rather imitable and substitutable. From this discussion, we ascertain that the fast mover advantage, which means fast innovation in this case, can avoid “hold-up” by the customer.

5.5.2.5 Opportunism and Timing

In order to secure a competitive advantage, a firm must create more value than the costs associated with creating that value. Obayashi is currently investing heavily in many fields of research and developing unique solutions to every project. The nature of the industry, which is that all projects are “unique,” makes it hard to horizontally diffuse specific technology. Accordingly, the cost probably exceeds the created value. However, more intangible assets such as brand, reputation, technological knowledge, learning and experience embedded in the culture, apply to all projects and businesses, and thus, are unlikely exceed the cost to create them, although it is hard to evaluate those costs and values.

We suggest that the firm consider strategic horizontal diffusion of their acquired resources such as knowledge, learning and experience, and technology. Through the interview, we find that there is still room for improvement in Obayashi’s feedback mechanism related to their intangible asset management. However, further investigation would be beyond the scope of this paper.

Because of its intangible assets and strategic technology innovation and diffusion, Obayashi enjoys profitable opportunities. This element of the Resource-Based View model; therefore, supports the notion that Obayashi has a competitive advantage. If Obayashi can adequately address the challenges it faces in appropriating the value it creates, a sustainable competitive advantage may arise.
5.5.3 Porter Model

The Porter Model consists of two main analytical tools, the five-forces analysis for environmental scan and the value chain analysis for internal scrutiny. In conjunction, they are used to determine the attractiveness of an industry.

5.5.3.1 Five-Forces Analysis

The five forces include intensity of rivalry among competitors, threat of new entrants, threat of substitutes, bargaining power of buyers, and bargaining power of suppliers.

We will now utilize the five-forces analysis on a business sector. This business sector is defined as non-Japanese investment, public sector, transportation, North America, and general contracting projects (the business), based on the segments depicted in the business segmentation matrix in Section 3.1 (Figure 3.1-5).

Our overall assessment of the business attractiveness is “unattractive to mildly attractive” as shown in Appendix 1. The illustration below provides an overview of the primary elements of the business structure (Figure 5.5-1).

In this paper, we are using seven categories to assess the business attractiveness. Appendix 1 shows our assessment of each category and a summary of our analysis is included below:

- **Barriers to entry:** Low. Potential entrants will rarely face significant barriers except scale economy effect, and experience and learning effect.
- **Barriers to exit:** Low. The industry, in general, is not capital intensive and assets are easily transferable.
- **Rivalry among competitors:** High. There are a large number of competitors, and low differentiated services count for high rivalry among them.
- **Power of buyers:** High. Buyers have many choices because of the abundance of contractors with low differentiated services. Moreover, there is no significant switch cost for buyers.
- Power of suppliers: Moderate. There are abundant suppliers, although they are important to the business.
- Availability of substitutes: Low. Close substitutes are not available to replace construction services.
- Government action: Moderate. Although there are several regulations governing the development of local companies, these do not prevent new firms from entering.
Barriers to Entry
(Low, Unattractive)
Potential entrants face few significant barriers except scale economies and experience/learning effect.

Government Actions
(Moderate, Neutral)
There is little significant interference from the government to discourage new entrants.

Bargaining Power of Suppliers
(Moderate, Neutral)
There are abundant suppliers, although each is important to the business.

Bargaining Power of Buyers
(High, Unattractive)
For many reasons, buyer power is strong.

Availability of Substitutes
(Low, Attractive)
Close substitutes are not available to replace construction services.

Intensity of Rivalry
(High, Unattractive)
A large number of competitors with low differentiated services account for high rivalry.

Barriers to Exit
(Low, Mildly Attractive)
The business is not capital intensive and assets are transferable.

Overall business attractiveness
Mildly Attractive

Figure 5.5-1: Five-Forces Analysis of Public Projects in the US
5.5.3.2 Value Chain Analysis

The value chain is composed of nine activities. Five of them are the primary activities such as inbound logistics, operations, outbound logistics, marketing and sales, and service. The other four are labeled support activities such as firm infrastructure, human resource management, technology development, and procurement. In conjunction with the value chain analysis, Porter introduces the generic strategies of cost leadership, differentiation, and focus.

Both Obayashi and local contractors, in the previously defined business sector, are competing for projects by utilizing cost leadership not differentiation. To find sources of cost leadership, we conduct the value chain analysis comparing Obayashi to local contractors. Appendix 2 shows our assessment of each of Obayashi’s activities against local competitors. There is no significant difference in activities such as operations, outbound logistics, and service. However, while Obayashi has significant advantages in technology development and in financial structure of firm infrastructure, other activities show the weakness of the firm: legal and government affairs in firm infrastructure; selection, appraisal, and reward system in human resource management; selection, value and price/cost analysis in procurement; material handling in inbound logistics; and physical conditions on offices and warehouses and price competition in marketing and sales.

Our overall assessment finds that Obayashi has “medium strength” when opposing local competitors as shown in Appendix 2. Figure 5.5-2 depicts Obayashi’s competitive advantages and disadvantages as related to their competition against local contractors.
Implications from the Porter Model

We have identified both opportunities and threats from the five-forces analysis and Obayashi’s strengths and weaknesses from the value chain analysis. Those key SWOT elements will be the basis of the strategy formulation in for Obayashi.

<table>
<thead>
<tr>
<th>Key opportunities</th>
<th>Key threats</th>
<th>Strength</th>
<th>Weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Large economies of scale effect</td>
<td>• Low product differentiation</td>
<td>• Technology development</td>
<td>• Firm infrastructure</td>
</tr>
<tr>
<td>• Large experience and learning</td>
<td>• Low switching cost</td>
<td>• Finance</td>
<td>• Human resource management</td>
</tr>
<tr>
<td>threat</td>
<td>• Large number of competitors</td>
<td></td>
<td>• Procurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Inbound logistics</td>
</tr>
</tbody>
</table>

Figure 5.5-3: SWOT for Public Projects

Moreover, we can formulate a generic strategy linked both with industry/business attractiveness and business strength by using the GE-McKinsey 9-block matrix (see Figure 5.5-4). The position in “medium” industry/business attractiveness and “medium” business strength
yields the following strategy for Obayashi: “Identify growth segments, specialize, and invest selectively.”

![Figure 5.5-4: Position in Industry Attractiveness – Business Strength Matrix](image)

As we have seen so far, implications from the Porter Model are neither instructive nor informative for managers enough to be able to formulate strategic planning. These implications only suggest “generic” guidelines. The following section discusses the Delta Model, of a mostly instructive framework, compared with the RBV and Porter Model.

### 5.5.4 Delta Model

The following sections use the Delta Model to analyze Obayashi in the public construction industry of North America. First we will chart Obayashi’s strategic positioning, then talk about the adaptive processes necessary to achieve that positioning. Accordingly, we will provide granular metrics to gauge performance in achieving this positioning.
5.5.4.1 Strategic Positioning

Obayashi’s operation unit in Boston, which we see as a strategic business unit (SBU), is employed on several projects around the Boston area. Among them, is the Central Artery/Tunnel project (CA/T). More precisely, they have been employed in specific sections as a contractor, C07A1, C17A9, and C17A2. Besides the CA/T project, Obayashi is also participating in the Massachusetts Bay Transportation Authorities (MBTA) project, which encompasses the MBTA Green Line Relocation and MBTA North Station Transportation Improvement. In addition, there is a project from the Massachusetts Water Resources Authority (MWRA). The details of these projects are shown in Figure 5.5-5 (GC = general contracting, and DB = design-build).

<table>
<thead>
<tr>
<th>Project</th>
<th>Contract</th>
<th>Entry Mode</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBTA North Station Transportation Improvement</td>
<td>GC</td>
<td>Joint Venture (Minority)</td>
<td>$86 mil.</td>
</tr>
<tr>
<td>Green Line Relocation and Garage Construction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C07A1 Central Artery</td>
<td>GC</td>
<td>Joint Venture (Minority)</td>
<td>$320 mil.</td>
</tr>
<tr>
<td>Bird Island Flat Tunnel/Vent Building No.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C17A2 Central Artery</td>
<td>GC</td>
<td>Joint Venture (Minority)</td>
<td>$147 mil.</td>
</tr>
<tr>
<td>I-93 State Street to North Street</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBTA Green Line Relocation</td>
<td>GC</td>
<td>Joint Venture (Minority)</td>
<td>$92 mil.</td>
</tr>
<tr>
<td>Haymarket Station to Causeway Street North Station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C17A9 Central Artery</td>
<td>GC</td>
<td>Joint Venture (Minority)</td>
<td>$340 mil.</td>
</tr>
<tr>
<td>I-93 High Street to State Street Over Blue Line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Massachusetts Water Resources Authority Waterworks Division</td>
<td>GC</td>
<td>Joint Venture (Majority)</td>
<td>$145 mil.</td>
</tr>
<tr>
<td>Metrowest Water Supply Tunnel Construction Package No.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C17AA Central Artery</td>
<td>GC</td>
<td>Joint Venture (Minority)</td>
<td>$165 mil</td>
</tr>
<tr>
<td>I-93 Tunnel Finishes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niagara, Canada Power Generation</td>
<td>DB</td>
<td>No</td>
<td>C$370 mil</td>
</tr>
<tr>
<td>Tunnel Project</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 5.5-5: Project Summary

The firm first became engaged in projects in and around the Boston area with the MBTA Green Line Relocation and Garage Construction project. In planning to bid this project, Obayashi noticed that they were not competitive enough to compete on the cost leadership position. However, they knew that, in the public project and as a contractor, they had to compete in that position. This notion led Obayashi to find a local firm with which to form a joint venture or
strategic alliance. The value chain analysis in a comparative approach relative to competitors would give the firm the criteria to find the ideal partner to compete against other bidders. Based on the weaknesses found in the value chain analysis (as shown in Appendix 2), the criterion is to attempt to supplement these weaknesses. Furthermore, we believe that we should consider the value chain analysis of a partner, which would tell us whether we could provide its needs. In this case, Obayashi found Modern Continental (Modern) whose local expertise supplemented Obayashi’s weaknesses. Modern benefited from Obayashi’s strong financial structure, which gave them the opportunity to bid for multi-million projects. Naito (1998) studied strategic alliances for E&C firms and conducted a case study on the alliance between Obayashi and Modern Continental. His paper points out three important successful factors: capability; compatibility; and commitment. Moreover, when we need to see capability fit, the value chain analysis would give us very clear understanding of the two parties’ capabilities. Obayashi’s weakness in local expertise, as found by the value chain, is complemented by Modern. In addition, Modern’s weak in financial structure is complemented by Obayashi. With complementary capabilities from Modern, Obayashi became fully competitive in bidding on public projects.

With Modern Continental, Obayashi clearly focuses on a Best Product strategy. Because, in the public sector and general contracting projects, award is based on the lowest price bid, it is reasonable that Obayashi pursued this position, spending most efforts on reducing project cost in order to underbid competitors. In this position, attention is paid: firstly, to operational effectiveness; secondly, innovation; and thirdly, customer targeting. Obayashi’s adaptive processes for operational effectiveness include: taking advantage of economies of scale in operation (e.g. reuse of equipment) and in human resource (e.g. reallocation of staff); and utilizing local expertise provided by Modern in marketing and service.

It is reasonable to assume that, after gaining experience on several projects, Obayashi could then become more competitive in bidding, due to its improved operational effectiveness. The question we are now faced with, is how Obayashi could be competitive when first bidding on a project. We find that, in response, Obayashi was not clear about its competitiveness and underbid the project, expecting change orders to eventually help them achieve operational profitability while hoping that managerial and operational efficiency would improve; and therefore, keep costs to a minimum. Through the interview, we found that our manager’s strong
“strategic intent” with his insightful perspective allowed Obayashi to underbid the project and led it to successfully achieve eventual operational profitability.

Our interview revealed that Obayashi made a successful bid on a project in Niagara, geographically far from the Boston area, where Obayashi has no local partners. However, they were successfully awarded the project. It is important to understand the strategy behind this success, as Obayashi’s weakness, identified through the value chain analysis, still remains true.

In Niagara, the project Owner is a power generation company headquartered in Canada. The project was awarded as design-build (DB) with Obayashi as the design-builder. This requires the more sophisticated capabilities of a construction company; and therefore, significant changes to the five forces occur. The entry barrier was raised reducing existing rivalry, thus creating a more attractive business sector.

In design-build projects, Obayashi uses more resources such as technical knowledge (allowing better design) and strong financial structure (allowing them to take more risk). Technically difficult DB projects are Obayashi’s strength in the market place and help increase their profit margin. This is a Best Product positioning that focuses more on differentiation rather than cost leadership.

5.5.4.2 Adaptive Processes

To pursue this Best Product positioning, we recommend that Obayashi take the adaptive processes illustrated in the following matrix (Figure 5.5-6).
To be successful in this market with Best Product strategic positioning, Obayashi needs to focus primarily on operational effectiveness, offering a best product through improvements in their internal value chain, and then on product innovation. There is no other way for Obayashi to retain and expand its market share. As we have discussed in Section 3.3.4, the first priority is operational effectiveness; the second, innovation; and the third, customer targeting.

Obayashi has already started conducting the adaptive processes described above. They first reduced costs by utilizing economies of scale effect and their expertise in tunneling combined with Modern’s expertise in cut-and-cover method. They then proposed innovative construction methods for value engineering, thus reducing project costs. The interview with our
manager has found Obayashi’s efforts to reach a Best Product position. In order to improve operational effectiveness, Obayashi expanded projects and increased contracts, expecting effects of scale/scope economy and learning/experience, incorporated many new ideas for reducing costs, and changed some construction procedures. Notably, temporary slabs were successfully eliminated by installing permanent slabs earlier than originally designated. This innovative method fully maximized efficiency and benefited not only them but also the project Owner; and therefore, it was accepted widely as value engineering. By these adaptive processes for operational effectiveness, innovation, and customer targeting, Obayashi is able to reach a Best Product position.

5.5.5 Circular Dynamic

So far, we have conducted the iterative approach including the Resource-Based View, the Porter Model, and the Delta Model. The circular dynamic following the iterative approach is the essence of the proposed Framework and will lead us to a higher and more sophisticated level of strategic thinking. In this section, we are proposing the possible use of the circular dynamic.

The question remains of how positioning affects the firm’s resources, and vice versa. To ease the understanding of the ultimate concept linking long- and short-term visions, in other words, linking core competencies and strategic positioning, we provided the following two figures.

Figure 5.5-7 intends to show the relation between resources and positioning. To explain the profitability of the firm within the industry/business, we use the classic two dimensions of industry/business attractiveness and competitive positioning. We can see, with this figure, how the firm’s resources can affect industry attractiveness and how those resources work when the firm takes one of strategic positioning. In addition, the figure shows that the strategic positioning affects resource development or core competency development. The figure is not perfect, but is rather intended to show the conceptual link between three areas such as industry attractiveness, positioning, and core competencies.

In the previous section, we have discussed which resources of the firm Obayashi is using for projects. For the public general contracting (GC) projects with a local partner, they exploit just only a few of their resources such as strong financial structure and technological knowledge. However, we analyze that projects will benefit Obayashi more if they consider developing all
their resources. Successful projects will likely contribute to develop such resources as reputation, technological knowledge, learning and experience, and eventually, a strong financial structure.

For the latter example of the public Design-Build project without a partner, Obayashi has an opportunity to exploit more of their resources than on the former GC projects: financial resources; technological knowledge; and accumulated learning and experience. Partly, as described previously, their strong corporate financial structure allows Obayashi to take on the riskier project, because their technological knowledge affords better design and engineering solutions in both cost reduction and differentiation, and more importantly and interestingly, they exploit their learning and experience from the former project of the CA/T, for example, by assigning their engineers to the latter project who have learned and experienced by working together with Modern Continental. If we look at benefits of the project in terms of a resource-based perspective, we can conclude, although it is too early to judge since it has recently started, that the project will help develop such resources as reputation, production technology, learning and experience, reputation, brand, and technological knowledge.
Figure 5.5-7: Relationship between Resources, Five-Forces, Strategic Positioning, and Adaptive Process Objectives
The question arises on how these resource developments can contribute to the firm. An important concept is presented in Figure 5.5-8 and helps to understand the linkage between core competencies and the competitive advantage. The theory of the Resource-Based View argues that, when the firm has resources and these resources meet four conditions (such as uniqueness, sustainability, appropriability, and cost/opportunism), these resources become core competencies and lead the firm to competitive advantage. According to the theory, the firm has to realize what their resources are, then use and develop them.

In this case study, we see that Obayashi uses several resources and will certainly obtain benefits by utilizing those resources. In Figure 5.5-8, we have marked resources presently in use and for later development. These resources should primarily meet four conditions as shown to become core competencies. With this figure, we suggest that the firm first see the strategic use of some of its resources and then predict the final strategic development or acquisition of the resources. In developing or acquiring resources, the firm checks the four conditions to be met. Although this concept of developing resources to core competencies for a competitive advantage is conceptual and elusive, we believe that the suggested framework is useful to help us understand how to develop core competencies leading us to think how to sustain, appropriate, and not be counteracted by cost.

With this figure, we understand that Obayashi has several resources (listed in the left-hand column), and these resources meet four conditions, and thus work as core competencies, that is, sources for a competitive advantage. Obayashi uses only some resources for the projects in this case study, but has opportunities to develop them or acquire new ones. (See columns entitled “strategic use” and “strategic development.”) In developing or acquiring resources, Obayashi must focus on the method of deploying resources whilst checking the four conditions.

With regard to the projects in this case study, we analyze Obayashi’s strategic use and development of its resources. As these projects go well, Obayashi may be able to expect reasonable returns from them. However, in terms of strategic use of resources, they do not use their resources extensively. In addition, in terms of development/acquisition of resources, they are only be able to develop some resources that are currently used on the projects, and cannot hope to acquire new resources. From our analysis, by using tangible data such as financial and numerical, we may conclude that Obayashi is successful in its projects. However, by using the
suggested framework represented in Figure 5.5-8 for analyzing core competency development, we suggest that Obayashi may find better business areas to utilize more of its resources, where Obayashi will be able to have more opportunities to develop its resources or acquire new ones.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Four conditions</th>
<th>Strategic Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uniqueness</td>
<td>Sustainability</td>
</tr>
<tr>
<td>Patents</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Brands</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Company reputation</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Flexible culture</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Market share</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Firm size</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Financial resources</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Production technology</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Technological knowledge</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Accumulated learning and experience</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>High quality production</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Vertical integration</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Strong customer relationship</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>New resources</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 5.5-8: Strategic Use and Development of Resources
5.5.6 Management Interview

As mentioned earlier in this chapter, we have interviewed a manager regarding Obayashi’s mission statement, resources, environmental scan, internal scrutiny, positioning, adaptive processes, and other policies. A summary of the interview is provided below. See Appendix 3 for interview questions.

Q1 Mission Statement

Although the manager is familiar with the corporate mission statement, he does not regard it as a guideline or a basis for his business mission, as the corporate mission statement is too elusive for his purposes. When asked a question of what his business mission was, he simply responded that it was just to increase sales and profits.

This answer implies that the business (Obayashi’s operation in Boston) does not have any long-term vision that is incorporated in the corporate mission, and thus, does not know its course of action.

Q2 Resources

When questioned on Obayashi’s resources, the manager pointed out that the business fully exploited its sound corporate financial structure as an advantage. He also noted employees’ capabilities and their strong commitment to the firm, repeatedly espoused that a construction firm was all about people and nothing else, and stated that knowledge embedded in employees is an intangible asset of the firm.

Q3 Market Evaluation

Based on Porter’s five-forces analysis, we questioned our manager regarding buyers, rivalry, suppliers, new entrants, and substitutes, but, since he was not familiar with this framework, his answers do not apply here. In general, his evaluation of the business environment focused mainly on rivalry and new entrants to the market.

Considering the nature of this business where there are other less significant forces (e.g. substitute power is negligible, buyer power is one per project, and many suppliers are available), there may not be an advantage in considering all the five-forces.
Q4 Value Chain Analysis

When we brought up the value chain question, our manager simply pointed out their strong bond credit or financial strength, which is reasonable to understand as these issues are important to him as he exploits them in his area of responsibility. He went on to point out Obayashi's weak local operation compared with other companies. Although he acknowledged Obayashi's strong capabilities in their corporate headquarters in Japan, he noted that his local office did not count on much support from headquarters.

In their local business operation, we could not find the configuration and coordination of activities found at the corporate level. We assume that this is partially due to organization structure. Obayashi has a specific overseas department, which works as an SBU. In more globalized firms, there is no overseas department and the overseas business function is diffused into all activities throughout the firm.

Q5 Strategic Positioning

Next, when we interviewed him on the positioning issue, he emphasized the cost leadership position, which is reasonable since Obayashi's main focal point is public projects that are awarded to the lowest bidder.

Q6 Adaptive Processes

After clarifying the positioning issue, we stepped into the question of the adaptive system, which focused on how Obayashi improved its positioning. His response implied scale economy effects, learning curve effects, and especially organizational learning.

Q7 Resource Development

For all projects (except the MWRA project), Obayashi has minority partnership around 40% in a joint venture and relies on the majority partner for the day-to-day operation of the project. The manager agrees that, for these projects, Obayashi (as a business unit) mainly exploits its corporate financial structure as an advantage and does not maximize or develop its other resources of the firm. However, for the MWRA project, Obayashi took the majority partnership and is responsible for day-to-day operations. The manager recognized the importance of developing a capability to operate projects single-handedly.
In the tunnel project in Niagara (see Section 5.5.4.1), Obayashi is managing the project alone. Our manager explained that this is possible for them because they have improved their operational capability since first working in the US market. He also mentioned that Obayashi was seeking opportunity to take responsibility for operations in order to develop this operational capability, and he understands the need for improvement of the operation in other areas in addition to Obayashi’s tunneling expertise exploited on this project.

In our opinion, Obayashi is facing a short-term and long-term dilemma.

Q8 Others

Through the interview, we found much interesting strategic action taken in the US.

Tunnel Projects: When Obayashi first came to the US, they observed strategic markets and found that they could not gain wide entry, and thus, only chose big tunnel projects for which it had high reputation in Japan. Our manager insisted that, when Obayashi analyzed at a tunnel project, they found few competitors. Those competitors often participated in bidding on similar projects, did not locally specialize, and, like Obayashi, nationally performed tunnel projects. Large tunnel projects are technically riskier and more capital-intensive since they sometimes require purchasing or ordering of tunneling boring machines (TBM) beforehand. Our manager said that there were a small number of competitors; and therefore, few locational disadvantages for tunnel projects. By using their sound financial structure and experience in tunnel projects, Obayashi could have been very competitive, but failed. Our manager’s analysis for this mistake was that Obayashi was not competitively effective to operate these projects. However, somehow, Obayashi’s executives allowed their US operations to lose money at the beginning and slowly became able to operate effectively and competitively.

Project in California: Bidding on a highway project in California, the Alameda Corridor, Obayashi formed a joint venture with: a Brazilian company (the majority partner); Modern Continental; and another partner. This design-build project’s anticipated budget was expected to be several hundred million dollars. In the middle of the bidding preparation process, the Brazilian company (the majority partner) withdrew from the joint venture, soon followed by the minority partner, thus leaving Obayashi and Modern Continental. Obayashi was left with two choices: to proceed with the bidding process taking over as the majority partner; or to withdraw from the project. Management chose to withdraw for several reasons: the project was in
California, therefore, they did not expect local expertise from Modern; our manager questioned Obayashi's capability to operate the project; and there was a human resource constraint at that time. Instead of proceeding with the project, our manager focused on the discussed tunnel project in Niagara, on which Obayashi had expertise.

**Procurement Decision:** In the Niagara tunnel project, a tunnel boring machine (TBM) had to be purchased, consisting a large portion of the project budget; and therefore, was an important factor in deciding the profitability of the project as a whole. When choosing a TBM, such factors as quality, service, and cost, from several machine manufacturers, were compared and a German company was chosen while rejecting offers from Japanese firms. Our manager realized the strategic meaning to Obayashi of purchasing from a Japanese firm, but decided on the cost factor as a priority.

### 5.5.7 Implications from the Analysis

- **Our manager does not have written formal strategic thinking framework.** However, his path of strategic thinking shows almost the same path as that suggested by our Framework. We could successfully prove the hypothesis in Section 4.5; and therefore, the validity of the proposed Framework is assured.

- **Our manager learns from his mistakes in the past.** For example, Obayashi’s inefficient operation caused them to miss a large project in California, and then they realized the need of operational capability and efficiency. However, our suggested Framework of formal strategic thinking process may have allowed the firm to reconsider their operation while avoiding such a failure.

- **Our manager does not rely on Obayashi’s corporate headquarters and has to tolerate weaknesses in the local business operation to some extent, and under these constraints, he tries to improve that operation.** Obayashi (as a business unit) does not exploit any coordination and configuration of activities at the corporate level, because it believes that corporate level policy making is beyond the business and involves the changes of the corporate level organizational structure. The need for more globalization in the future will expedite the coordination and configuration of activities, which will soon become in response to the increasing need of globalization and require corporate level decision-making.
• Our manager has no written clear business mission; and therefore, strategies have been emergent and opportunistic. Having a formal strategic thinking framework requires a clear written business mission.

• A reward system might discontinue the linkage or alignment between business and corporate level strategies. As we have seen in the decision on the purchase of the TBM for the tunnel project, our manager prioritized the profit to the business level and not to the corporate level. The reward system has significant influence on the decision criteria of the business. As is often said “You get what you measure” or “Tell me how you will measure me and I will tell you how I will behave,” the measurement system defines the actions. The measurement system has to be aligned to business and corporate level strategies.
5.6 Case 2: Application of the Framework to the US Market (Private Sector)

The case we have chosen deals with private sector projects from Japanese companies in the US. Obayashi’s offices in New York, Chicago, Atlanta, Los Angeles, San Francisco, and elsewhere have been working on manufacturing facility projects in the US since 1974. Obayashi entered this new arena to support Japanese customers.

5.6.1 Project Description

First, we look at the investment by Japanese companies in the US. Japanese investments in the US started about the same time that Obayashi initiated its US operation in 1974. This investment did not grow until the early 1980s, from which time Japanese developers and manufacturers invested heavily in the US due to surplus liquidity and the yen’s appreciation. These investments helped to mitigate the trade imbalance between Japan and the US. However, in the early 1990s, the so-called “bubble economy” burst. Many firms reduced their overseas investments and some manufacturing firms shifted their investments to Asia.

Following the same trends, Obayashi’s customers entered the US with Obayashi’s support. Obayashi worked for virtually any kind and any size project for these customers, including hotels, office buildings, restaurants, interior renovation, manufacturing facilities, apartments, and condominiums. Until the late 1980s, most projects were small. From the middle 1980s to the middle 1990s, many manufacturing firms invested heavily in their manufacturing facilities.

Although Obayashi has been working for multiply diverse projects for their Japanese customers, their focus has been on high-tech manufacturing facilities, including: Toyota in Kentucky in 1986; Canon in Virginia in 1986; Matsushita in Ohio in 1988; NEC in California in 1989; Komatsu in Oregon in 1995; and Sumitomo in Arizona in 1995.

5.6.2 Resource-Based View

As the Resource-Based View looks at the firm as a whole, what we have discussed in the previous case still holds true and we discuss the issues specifically relevant to projects in this section.
5.6.2.1 Unique Competencies

Obayashi’s strong relationship with their customers drove them to come to the US. To serve their needs, Obayashi has developed varied technology and knowledge and have accumulated learning and experience on “legacy” practices in the construction industry in this different business environment. They can now serve their customers better than other Japanese competitors because of this acquired superior experience.

To meet customers’ need, Obayashi established an Engineering Department in the early 1980s, specializing mainly in manufacturing facilities and covering all phases of the project from project formation, feasibility study, concept and detail design, construction, operation, and finally to maintenance (see Figure 3.3-5 in Section 3.3.5.2). The need for this department is for both domestic and overseas projects. Production systems, facility requirements, and societal requirements in energy and the environment are becoming more complex and sophisticated. Some firms started to outsource engineering knowledge, causing the growth of Obayashi’s Engineering Department. Overseas projects place a heavy demand on the Engineering Department because of customers’ inability and inexperience to divide and outsource each scope of the work.

From the middle 1980s, Obayashi’s technology developed in the Engineering Department, accompanied with their learning and experience acquired in the US market, has differentiated them from other Japanese competitors, making them unique in the industry.

5.6.2.2 Sustainability

There is no doubt that the combination of technology and knowledge in manufacturing facilities and their learning and experience in the US is the unique competency of Obayashi. However, we have to check its sustainability. Leonard-Barton (1992) proposes her idea of core capability as a “knowledge-based view of the firm” and defines core capability as the knowledge set that leads to competitive advantage. There are four criteria for knowledge to be a source of competitive advantage: firstly, knowledge is embodied in employees; secondly, this knowledge is embedded in technical systems; thirdly, the process of knowledge creation and control is guided by managerial systems; finally, these knowledge, technical systems, and managerial systems are associated with the values and norm.
Since the inception of the Engineering Department, all have accepted the challenge of cultivating other engineering fields so that Obayashi could offer more diversified services to their customers. Because there has been a favorable resource allocation to the Engineering Department, it has now become one of Obayashi’s best-established departments, fully communicating and collaborating with other departments. In 1996, the Engineering Department’s efforts accounted for 7% of total sales. This confirms that knowledge within the Engineering Department meets the four criteria that Leonard-Barton insists; and therefore, we conclude it is sustainable.

5.6.2.3 Appropriability

The knowledge and technology nurtured by the Engineering Department of Obayashi undoubtedly produces rents. The knowledge and the learning/experience in the US market gave the firm a strong competitive advantage. By engineering total flows of sophisticated manufacturing facility projects, the firm produces more rents than traditional delivery methods can. These rents benefit both the firm and their customers. Successful results repeatedly reinforce the firm’s reputation as well increasing its experience, described as “positive feedback,” and the question of appropriability is minimum if the firm works in this positive feedback cycle.

5.6.2.4 Opportunism and Timing

The last question discusses the important issue of “opportunism and timing” or cost of acquiring the knowledge and technology that we have discussed. If costs of knowledge offset its rents, it is no longer a competitive resource. Obayashi embraced this issue. In fact, the Engineering Department was reorganized in August 1998 according to the prevailing severe environment, centralizing once-bipolarized management in Tokyo and Osaka and converging nine sections into seven to streamline their operations and workforce. Furthermore, they became more selective in seeking promising fields by shifting more efforts in those directions. As long as Obayashi understood its core competency, this streamlining reorganization would benefit them and enable them to manage the opportunism and timing issues.
5.6.3 Porter Model

Our projects are categorized as Japanese investment, private sector, and manufacturing, according to the Business Segmentation Matrix in Section 3.1.4 (Figure 3.1-5). Delivery type varies between design-build (DB), construction management (CM), and turnkey (TK). See Figure 5.6-1.

<table>
<thead>
<tr>
<th>Project</th>
<th>Location</th>
<th>Year</th>
<th>Cost (Yen)</th>
<th>Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toyota</td>
<td>Kentucky</td>
<td>1986</td>
<td>Cost + Fee</td>
<td>CM</td>
</tr>
<tr>
<td>Canon</td>
<td>Virginia</td>
<td>1986</td>
<td>3,200 mil.</td>
<td>DB</td>
</tr>
<tr>
<td>Matsushita</td>
<td>Ohio</td>
<td>1988</td>
<td>3,300 mil.</td>
<td>DB</td>
</tr>
<tr>
<td>NEC</td>
<td>California</td>
<td>1989</td>
<td>15,700 mil.</td>
<td>DB</td>
</tr>
<tr>
<td>Komatsu</td>
<td>Oregon</td>
<td>1995</td>
<td>23,900 mil.</td>
<td>DB</td>
</tr>
<tr>
<td>Sumitomo</td>
<td>Arizona</td>
<td>1995</td>
<td>11,700 mil.</td>
<td>DB</td>
</tr>
</tbody>
</table>

Figure 5.6-1: Project Summary

5.6.3.1 Five-Forces Analysis

We will now impose the five-forces analysis on these manufacturing facility projects (as a business sector), using seven categories as in the case one, the public works projects in Boston.

Our overall assessment of business attractiveness is "highly attractive" to "mildly attractive." The illustration below provides a compact description of the primary elements of the business structure (Figure 5.6-2). A summary of our analysis is also included:
• **Barriers to entry:** Moderate. Compared to Case 1, barriers to entry become higher in almost all elements (see Appendix 1 for comparison). Product differentiation and brand identification are of great importance in DB and CM projects. The difference of haves and have-nots of technology is crucial. Experience and learning effect is important.

• **Barriers to exit:** Low. As we have seen in Case 1, the industry/business is not capital intensive and assets are easily transferable. Barriers to exit are as low as in Case 1.

• **Rivalry among competitors:** Moderate to low. The number of competitors dramatically decreases. Differentiation of services is crucial; and thus, lowers rivalry among competitors.

• **Power of buyers:** Moderate to low. Punctual completion and reliability of functional facilities are critical to buyers that plan to manufacture high-tech products. Therefore, contributions of the industry/business to buyers’ products and services are critical and make buyers’ “switching cost” high. This lowers buyers’ powers.

• **Power of suppliers:** Moderate to low. Suppliers’ threats of forward integration lessen because of complexity of projects. On the contrary, industry/business’ threats of backward integration become high. This contributes to lowering powers of suppliers.

• **Availability of substitutes:** Low. There are no close substitutes to replace industry/business’ services, as seen in Case 1.
• Government actions: Moderate. Since the projects are not public, the government does not intervene in industry/business’ activities as much as in public projects.
Barriers to Entry
(Moderate, Neutral)
Potential entrants face barriers in the importance of product
differentiation, brand identification, technology, and experience
and learning effect.

Government Actions
(Moderate, Neutral)
Since the projects are private, the government does not intervene
as much as in public projects.

Bargaining Power of Suppliers
(Moderate to low, Attractive)
Because of technological requirements, suppliers' threats of forward integration are low. On the contrary, backward integration of the business is high.

Bargaining Power of Buyers
(Moderate to low, Attractive)
Contribution of the business to buyers' business is very high.

Availability of Substitutes
(Low, Attractive)
Although there are many possible substitutes, they are not close enough to replace the business.

Intensity of Rivalry
(Moderate to low, Attractive)
The number of competitors decreases because of importance of differentiation and technological requirements of projects.

Barriers to Exit
(Low, Mildly Attractive)
Barriers to exit are low. The business is not capital intensive and assets are transferable.

Overall business attractiveness
Attractive

Figure 5.6-2: Five-Forces Analysis of Private Projects in the US
5.6.3.2 Value Chain Analysis

Value chain analysis is very useful for assessing Obayashi’s (as a business unit) activities in comparison with its competitors. When we conduct the five-forces analysis, we assume that competitors are only Japanese firms. However, we need to define who Obayashi’s competitors are. There are two different competitors for projects from Japanese customers. These are either Japanese firms (US based) or local US firms. In this section, we conduct the value chain analysis for both.

Since the projects are DB, CM, or TK, and require the sophisticated integration of planning, design, and construction, both Obayashi and other competitors are competing to acquire projects by differentiation not by cost leadership. Further detailed investigation of positioning is discussed in the following Delta Model. To find sources of differentiation, we conduct the value chain analysis comparing Obayashi’s operation in this business sector (Obayashi) with Japanese firms also US based (Japanese) and local competitors (Local).

First, we discuss Local competitors. In comparison with Local firms, we have found Obayashi’s strengths in almost all activities. Specifically, Obayashi has significant advantages in technology development and marketing/sales, that is, in technology and customer-relationship. Obayashi finds its weaknesses in activities related to local issues. These weaknesses are legal issues in firm infrastructure, selection and development in human resource management, and physical location for providing service.

Our overall assessment of Obayashi is that they are relatively strong compared to Local competitors. Figure 5.6-3 summarizes the competitive advantages and disadvantages of Obayashi relative to its Local competitors.
Secondly, we analyze Japanese competitors. In comparison with Japanese competitors, Obayashi has competitive advantage in almost all activities. In contrast with the previous conclusion, Obayashi has only a slight advantage in technology development and marketing/sales due to its careful selection and horizontal development of technology and focused differentiation strategy of products. However, Obayashi finds its strong competitive advantages in other activities, specifically, its significant strength in operation and services attributable to experience and learning through its prolonged US operation.

Our overall assessment shows Obayashi's dominance and strength over its Japanese competitors. Figure 5.6-4 summarizes the competitive advantages and disadvantages of Obayashi relative to its Japanese competitors.
Implications of the Porter Model

We have identified both opportunities and threats derived from the five-forces analysis and Obayashi’s strengths and weaknesses according to the value chain analysis. These key SWOT elements will be the basis of the strategy formulation for Obayashi.

<table>
<thead>
<tr>
<th>Key opportunities</th>
<th>Key threats</th>
<th>Strength</th>
<th>Weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Product/service differentiation</td>
<td>• Buyers’ backward integration</td>
<td>• Customer relationship</td>
<td>• Customer relationship</td>
</tr>
<tr>
<td>• Brand identification</td>
<td>• Suppliers’ forward integration</td>
<td>• Technology advance</td>
<td>• Legal issues</td>
</tr>
<tr>
<td>• Technology</td>
<td></td>
<td>• Selection and</td>
<td>• Human resource management</td>
</tr>
<tr>
<td>• High buyers’ switching cost</td>
<td></td>
<td>Horizontal development of technology</td>
<td>• Service providing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Experience and learning effects</td>
<td>locations</td>
</tr>
</tbody>
</table>

Figure 5.6-5: SWOT for Private Projects

Moreover, we formulate generic strategy associated with the industry/business attractiveness and business strength matrix (see Figure 5.6-6) by using the GE-McKinsey 9-
block matrix. The position of “high to mild” of industry/business attractiveness and “high” of business strength suggests the strategy for Obayashi that is between; “Identify growth segments, invest strongly, maintain position elsewhere;” and “Grow, seek dominance, and maximize investment.”

As we have seen so far, implications from the Porter Model are neither instructive nor informative for managers to formulate strategic planning, although these implications can give them very “generic” guidance. The following section discusses the Delta Model, which is mostly instructive framework compared to the RBV and Porter Model, which we have concluded are not.

5.6.4 Delta Model

Here we use the Delta Model to analyze Obayashi’s business in the Japanese investment, private-sector construction industry of the US. First we chart Obayashi’s strategic positioning,
then talk about the adaptive processes necessary to achieve that positioning. Accordingly, we provide granular metrics to gauge performance in achieving this positioning.

So far, we have focused on sophisticated high-tech manufacturing facilities. However, in this section, we capture Obayashi’s strategic positioning that includes other types of projects, too.

5.6.4.1 Strategic Positioning

Although Obayashi has been focusing on the sophisticated high-tech projects (high-tech projects) that we have discussed, there are not always sufficient of projects satisfying the firm’s bidding requirement level. While focusing on high-tech projects, the firm also engages in varied other projects: hotels; office buildings; restaurants; interior renovation; factories; apartments; and condominiums.

Firstly, we discuss these varied projects. When Japanese investors came to the US, they were naïve and wanted Japanese construction companies to help them. Rivalry in those days existed only among Japanese companies. Obayashi fully employed their relationship with customers in Japan and collaborated with their corporate office for marketing directly with their customers’ headquarters in Japan. Rivals were limited and competition was mild according to the cost leadership or Best Product positioning. In that prevailing climate, Obayashi enjoyed relatively handsome returns. See Figure 5.6-7.

However, many Japanese customers migrated towards localization and became proficient at collaborating with local US construction and architect and engineering (A/E) firms (Local). These Local competitors were proficient at the design and construction of hotels, office buildings, and simple manufacturing facility projects. Then, Obayashi was faced with its Japanese customers requiring them to perform projects at the same cost as Local competitors. In cost competition with Local firms, Obayashi found themselves less competitive. As explained extensively in literature, the overhead cost allocated from the firm’s infrastructure and R&D of the headquarters was high, requiring Obayashi to make more profit than Local firms, and thus, positioning themselves less competitively.

Understanding their weaknesses, Obayashi shifted their focus to design-build projects and attempted to market design-build packages to their customers by becoming involved in
projects at their inception. Obayashi then embarked on the course of shifting their target to Total Customer Solutions positioning. See Figure 5.6-7.

However, not all projects were high-tech and sophisticated ("commodity") and it was hard to differentiate Obayashi from its Local competitors even with the design-build distinction. Then, Obayashi in 1986 acquired local construction companies for their operational effectiveness and cost leadership strategy while utilizing their own capabilities for the differentiation strategy. Because Obayashi was not successfully able to improve customer economy with “commodity” projects, they still had to hunt for the “productivity frontier” (see Section 2.2.6) or Best Product positioning. Shifting from the Total Customer Solution position, Obayashi is now pursuing the Best Product strategy for “commodity” projects. See Figure 5.6-7.

Figure 5.6-7 shows Obayashi’s strategic positioning for “commodity” projects. Obayashi began somewhere between the System Lock-In position and the Total Customer Solutions position. This initial strategic position was determined by: their strong relationship with Japanese customers (which implies the Total Customer Solutions position); and the customers’ naïveté in the US market urging them to accept Obayashi’s offers (which implies the System Lock-In position). Then, as we discussed above, the movement migrated first to the Best Product position, secondly to the Total Customer Solutions position, and finally to the Best Product position.
Secondly, we discuss sophisticated high-tech manufacturing facility projects. Now, we will look at competition with Local firms. These projects involve sophisticated process-support engineering; and therefore, there are significant technological requirements. Local firms rarely fulfill such requirements. Obayashi easily differentiated themselves from these competitors and assumed the differentiation strategy, taking their first steps towards Best Product positioning. See Figure 5.6-8.

However, there were many capable US firms on the national level that may become strong competitors. When Japanese manufacturing firms first emerged in the US, they were unfamiliar with US architects/engineers and contractors (US E&C firms) and were too naïve to be able to collaborate with them. However, as these Japanese customers became accustomed with local business practices, they found the ability to engage more in their projects and some companies were even able to use US E&C firms. In this environment, price competition increased and Obayashi had to pursue the cost leadership or the Best Product position. In this competitive climate, customers' power also became strong since they could choose from many suppliers, subsequently increasing rivalry. In this less attractive market, Obayashi had to reduce their profits moving further toward the Best Product position. See Figure 5.6-8.
However, Obayashi took an initiative toward the Total Customer Solutions position. Under severe competition, to maintain this competitiveness, Obayashi had to look at its core competency. They exploited strong relationships with its customers and became involved with projects at inception leveraging their customer relationships. In 1982, Obayashi established the Engineering Department that we have previously discussed. Since that time, manufacturing facilities have become more complex and high-tech and required fast completion because of short product lifecycle. As mentioned earlier, from the middle 1980s, Japanese manufacturing companies also invested heavily in the US due to surplus liquidity and the yen’s appreciation, helping to mitigate the trade imbalance between Japan and the US. Obayashi successfully acknowledged this trend and started employing its well-established Engineering Department in its corporate headquarters. Obayashi then improved collaboration with its customers in order to better understand its customers’ business operations. By doing this, Obayashi strove to improve its customers’ economy, thus tightening the bond between them. Obayashi’s shift from the Best Product position to the Total Customer Solutions position is depicted in Figure 5.6-8.

Figure 5.6-8 shows Obayashi’s strategic positioning for sophisticated high-tech manufacturing facility projects. Initially, Obayashi was somewhere between the System Lock-In position and the Total Customer Solutions position. Then, as discussed above, Obayashi’s strategy shifted first to the Best Product position, secondly, with much intensity, to the Best Product position, and finally to the Total Customer Solutions position.
5.6.4.2 Adaptive Processes

In the previous section, we covered two distinguished strategic positionings that were taken by the same business unit. In this section, we provide adaptive processes for these two strategic positionings, that is, for two distinguished types of projects.

Firstly, we discuss the “commodity” type of projects. Obayashi’s strategic positioning fluctuated between the Best Product position and the Total Customer Solutions position, but is now moving toward the Best Product position. Obayashi is focusing on design-build projects and attempting to differentiate themselves from their competitors. In retrospect, they failed to achieve the Total Customer Solutions position, and instead, shifted their position toward the Best Product position.

Obayashi’s choice between the Total Customer Solutions position and Best Product position is a strategic option to be decided by management. As we have seen, Obayashi chose the Best Product position. Thus, adaptive processes have to follow this decision and we now provide the following processes.

Commodity projects from Japanese companies and the project we dealt with in Case 1 (the Boston public works project) have some similarities. The former are Japanese investment, private-sector, building or manufacturing, and design-build. The latter are public-sector,
transportation, and general contract. Project profiles are different. However, the five-forces analysis and the value chain analysis for both types of projects would show similarity in industry/business attractiveness and business strength. In fact, the position for both is the same, the Best Product position. We assume that the adaptive processes for the latter are almost applicable to the former. We suggest that Obayashi take the following adaptive processes to achieve successful Best Product strategic positioning (Figure 5.6-9).

<table>
<thead>
<tr>
<th>Adaptive Processes</th>
<th>Performance Metrics</th>
</tr>
</thead>
</table>
| **Best Product Cost:** Focus on Internal Value | • Bidding price  
• Number of projects  
• Number of partners |
| • Lower unit costs through economies of scale  
• Lower unit costs through learning and experience  
• Outsourcing activities whose costs are not competitive  
• Strategic alliances for cost competitiveness  
• Use of technology to reduce costs |
| **Lowest Distribution:** Focus on Distribution Channel | • Number of contacts per customers  
• Completion dates  
• Number of value engineering proposals  
• Amount of $ saved by value engineering |
| • Early involvement  
• Focus on similar projects focusing on efficiency  
• Fast completion  
• Value engineering |
| **Product Innovation:** Focus on Breadth and Depth | • Number of innovated techniques  
• Number of innovated methods  
• Amount of dollars saved by these methods |
| • Innovate new techniques to maximize efficiency  
• Innovate new construction methods to minimize the cost |

Figure 5.6-9: Adaptive Processes and Performance Metrics for Best Product Positioning
To be successful in this segment (commodity projects) with Best Product strategic positioning, Obayashi needs to focus primarily on operational effectiveness, offering a best product through improvements on the internal value chain, and then through product innovation. We propose that this is the only way for Obayashi to attain and retain growth within the market. Its first priority should be to focus on operational effectiveness, next on innovation, and then on customer targeting, as described in Section 3.3.4.

The observation drawn from the interview with our manager reveals that Obayashi is still wandering between the Total Customer Solutions position and the Best Product position. To pursue the Total Customer Solutions position, the first priority should be the customer targeting, second be the operational effectiveness, and third, the product innovation. In fact, Obayashi is paying special attention to both operational effectiveness and customer targeting. Obayashi’s “middle of the road” position has contributed to its current low profitability and it appears that they struggle while working on this “commodity” type of projects.

Secondly, we discuss complex high-tech manufacturing facility projects. Obayashi’s strategic positioning is shifting toward the Total Customer Solutions position. To pursue this position, we suggest that Obayashi follow the adaptive processes necessary to achieve a successful Total Customer Solutions strategic position (Figure 5.6-10).
To be successful in this business sector of complex manufacturing facility projects with Total Customer Solutions strategic positioning, Obayashi should focus firstly on customer targeting, bundling products and services and customizing to best meet their customers’ demands and needs. Secondary, operational effectiveness within Obayashi assures that their offered
products and services improve customer economy, as Obayashi considers their customers’ value chains while in collaboration with them on a project. Finally, innovation enables Obayashi to offer superior customized services through joint development with their customers. As we have described in Section 3.3.4, Obayashi should give the first priority to customer targeting, the second to operational effectiveness, and the third to innovation, in shifting toward the Total Customer Solutions position. This suggested path is the only way that Obayashi will be able to grow, and then retain its market share.

We observe that Obayashi has already successfully conducted some of the adaptive processes described above. In some projects, we see the following processes. The Engineering Department initiates “customer targeting” by utilizing corporate marketing intelligence, and then the Department collaborates with the Sales/Marketing Department to proceed with that “customer targeting.” As the marketing efforts proceed, the Engineering Department starts collaboration with R&D, US based offices, and other departments, for innovation and operational effectiveness. By these processes, Obayashi is able to offer “total solutions” to its customers.

5.6.5 Circular Dynamic

As discussed in Case 1 (the Boston public works project), the circular dynamic following the iterative approach is the essence of our proposed Framework. It combines all results derived from analyses by the Resource-Based View, the Porter Model, and the Delta Model, incorporating long- and short-term visions and covering all changes within the industry. Since our Framework is conceptual, the following discussion is only one of the possible analyses.

With the circular dynamic, we can capture dynamic interactions between market, resources, and positioning. Case 2 dealt with two different types of projects (“commodity” and “high-tech”), and discussed two distinguished positionings (the Best Product positioning and the Total Customer Solutions positioning), which responded to different markets and deploy varied core competencies. The most important notion is found in the fact that one strategic business unit (SBU) pursues two different positionings. We need to examine this “duo strategy” in detail.

First, we analyze this situation by reviewing the market. The SBU conducts two different project types. While they focus on sophisticated high-tech manufacturing projects, they also have to bid on and gain other types of projects in order to mitigate market or demand cycles
while maintaining their human resources and the firm's basic infrastructure. The retention of the workforce and firm infrastructure is particularly important for the knowledge-based firm; because intangible assets are embodied in employees, embedded in technical and management systems, and associated with organizational value, and then such assets become the source of core competencies (Leonard-Barton, 1992). Retaining a firm's business volume and its core workforce is thus inseparable.

Secondly, our analysis is derived from the Resource-Based View. To pursue Best Product positioning in Commodity projects, the firm first improves operational effectiveness by deploying such resources as experience and learning, production technology, and technological knowledge, in order to gain efficiency and cost competitiveness. The adaptive processes employed to move toward the Best Product position, in return, contribute to the firm's experience and learning, technology, and knowledge of lean production. In addition, since the firm focuses on projects from its Japanese customers, engaging in these Commodity projects develops company reputation among and good relationships with its customers, which then become important factors in acquiring High-tech projects.

On the contrary, to pursue the Total Customer Solutions position in High-tech projects, the firm first improves "customer targeting," seeking customization and bundles of services. This Total Customer Solutions positioning then deploys resources such as the firms' strong customer relations, learning and experience, technological knowledge, company reputation, brand, financial resources, production technology, and high-level quality management. Through the adaptive processes to achieve this position for High-tech projects, the firm can enhance these same resources.

These two distinguished positionings (of Best Product and Total Customer Solutions) employ different resources and then develop these resources differently. However, these two also assist and enhance each other. For the Total Customer Solutions position, operational effectiveness is also important to increase overall profitability, while, for the Best Product position, customer targeting also helps to reach a better position, especially in the differentiation strategy.

In terms of resource use and development, Total Customer Solutions positioning for High-tech projects can contribute more to the firm. However, pursuing only one positioning strategy embraces risk. By over-focusing on one position, the firm allows itself to become
vulnerable and rigid when changes in the market occur. Some markets require high-levels of operational effectiveness and others require high-levels of customer targeting.

We believe that it is rationale that Obayashi is taking two different positionings. However, we now question whether one SBU can achieve apexes in each position simultaneously. In fact, Obayashi is very close to that apex in the Total Customer Solutions position for High-tech projects, but does not achieve the same level in the Best Product position for commodity projects. The position of an SBU in the multiple positioning strategy is a microcosmic analogy of that firm when comparing it to the portfolio management of multiple SBUs. Balancing among positions is closely related to balancing between market responsiveness and core competency development.

This then gives us strategic implication for analyzing Obayashi. By looking at the future demands of High-tech or Commodity projects, and accordingly, by focusing more either on the Total Customer Solutions position or on the Best Product position, Obayashi can find better positioning balance. If, within the next five to ten years, they strive for more High-tech projects, they will weight the Total Customer Solutions position over the Best Product position.

To meet the market demands, Obayashi has to flexibly change its positioning. This positioning change means not just meeting the current market myopically, but, more importantly, responding to the current and future markets with flexibility looking at resource requirements and core competency development with a long-term vision.

Balancing these discussed elements such as positioning, resources (core competency), and market response in the changing industry while forecasting the future of the industry is not an easy task, but our circular dynamic approach gives the firm a mechanism of strategic thinking. Figure 5.6-11 shows the conceptual dynamics among market, resources, and positioning.
5.6.6 Implications from the Analysis

- The proposed Framework aids the firm in capturing the dynamics among market, resources, and positioning.
- Balancing positioning implies balancing “resource development” and “market response;” that is, balancing long-term and short-term visions.
- A strategic business unit may pursue more than one positioning.
- To pursue multiple positionings, an SBU could employ functions of its corporate headquarters, which would be one of the models in the global market used to exploit coordination and configuration of activities across the corporate organization.
- There may be a “low performance trap” in the middle of the three distinguished positions of Best Product, Total Customer Solutions, and System-Lock-In.
CHAPTER 6

CONCLUSIONS

The intent of this thesis is to propose a framework for strategic thinking in the global market for large-scale Japanese construction firms. That Framework would enable firms to perform strategic thinking in a changing environment, capturing dynamic aspects of the industry and lead them to succeeding processes toward their choice of strategic position.

After identifying needs for a framework of strategic thinking for the construction industry and defining the purpose and scope of the thesis in Chapter 1, Chapter 2 first reviewed literature on strategic thinking and found three distinct powerful strategic analysis models, which together would cover virtually all of the major important theories in strategic management. These three models were the Porter Model, the Resource-Based View of the Firm, and the Delta Model.

The thesis, then in Chapter 3, reviewed the three models, examining their applicability to the industry, and analyzed their strengths and weaknesses. Based on this analysis, Chapter 4 integrated them and proposed a new Framework for strategic thinking, consisting of two contiguous approaches, the iterative and the circular dynamic.

Finally, the thesis applied the Framework to a Japanese construction firm through some case studies in Chapter 5, which allowed this thesis to depict practical usage of the proposed Framework as well as proved its applicability to the global construction market. This application further developed and complemented the Framework.

Having proposed a Framework for strategic thinking and proven its useful applicability, we believe that our Framework for strategic thinking will enable firms to advance to more competitive levels within the industry.

However, many firms do not have such a strategic thinking framework and rely on more informal process. This guides us toward two different strategy formulation processes, deliberate and emergent, as espoused by Mintzberg (1987).

With our proposed Framework, firms can deliberately formulate a strategy incorporating its long and short-term vision in response to a changing environment. However, our Framework is not structured to provoke emergent strategy. We believe that a further important agenda to the Framework for strategic thinking lies within these deliberate and emergent strategy formulation.
processes. Firms that manage the process of deliberate formulation of strategy, with both long and short-term vision, can reach above-average performance, and once they successfully incorporate a mechanism to induce emergent strategy within their organizations, they can then move to the next level of performance. Thus, we believe that, if a framework successfully incorporates two aspects of strategic thinking, such framework would become the ideal one.
### Appendix 1

#### Barriers to entry

<table>
<thead>
<tr>
<th></th>
<th>Highly Attractive</th>
<th>Moderately Attractive</th>
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<th>Moderately Unattractive</th>
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<td>Large</td>
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<td>Big</td>
<td>High</td>
<td>Reduced</td>
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<td>Switching cost</td>
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<td>Restricted</td>
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#### Barriers to exit

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<td>Government and social restrictions</td>
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#### Rivalry among competitors

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### Power of Buyers

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<tr>
<td>Availability of substitutes for</td>
<td>Many</td>
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</tr>
<tr>
<td>industry/business products</td>
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<td>Buyer's threat of backward integration</td>
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<td>integration</td>
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<td>Contribution to quality or service of</td>
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<td>buyers' products</td>
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<td>Total buyers' cost contributed by the</td>
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<td>industry/business</td>
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### Power of Suppliers

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<td>Highly Attractive</td>
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<td>suppliers' products</td>
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<td>Differentiation or switching cost of</td>
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<td>suppliers' product</td>
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<td>Suppliers' threats of forward integration</td>
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<td>Industry/business threat of backward</td>
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<td>integration</td>
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<td>Suppliers' contribution to equity or</td>
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<td>service</td>
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<td>Total industry/business cost contributed</td>
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<td>by suppliers</td>
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<td>Importance of the industry/business to</td>
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<tr>
<td>suppliers' profit</td>
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### Availability of substitute

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<tbody>
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### Overall assessment

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Appendix 3

Interview Questionnaire

Q1 Mission
- What does the Corporate mission statement say?
- What is your Business mission?

Q2 Resources
- What do you think the company’s core competency is?
- What is the company good at?
- What characteristics can differentiate the company from competitors?
- What can you list as the company’s assets, both tangible and intangible?

Q3 Market Evaluation
- How do you describe your market?
- How is rivalry?
- How do your customers act towards you?
- Who are your suppliers? How do they act?
- Are there any substitutes that could replace you?
- Do you expect new companies to enter the market?

Q4 Value Chain Analysis
How do you evaluate:
- Your activities?
- Firm infrastructure?
- Human resource management?
- Technology management?
- Procurement?
- Inbound logistics?
- Operations?
- Outbound logistics?
- Marketing and sales?
- Services?
- Yourself compared with competitors in these activities?

Q5 Strategic Positioning
- How are you competing with others?
- Do you compete by reducing cost?
- Do you compete by differentiating yourself from your competitors?

Q6 Adaptive Processes
- To compete with others, what did you do and how did you do it?
- How did you improve operational effectiveness?
- How did you improve technology?
- How did you deal with customers?
- Among operational effectiveness, innovation, and customer services, which did you pay attention to the most?
- Do you have a specific performance measurement system?

Q7 Strategic Use and Development of Resources
- Among your resources, what helps you to compete with others?
- How will those resources change and develop?

Q8 Others
- Are there any projects you failed to bid?
- What was the reason for failure?
BIBLIOGRAPHY


