

STRATEGIC MANAGEMENT IN CONSTRUCTION

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ABSTRACT: The traditional philosophy of management in construction, both in academia and in industry, places great emphasis on the ability to plan and execute projects. In contrast, a similar emphasis on strategic management has received less attention in the construction industry. Although the pressures of project performance can often obscure the broader social, economic, and professional context in which strategic management is undertaken, it is these broad contextual areas that make strategic management an essential issue for construction organizations. Rapidly changing social and technological issues are creating a professional environment that will look very different in the coming decades from that experienced in today's organizations. This paper introduces a study of the current strategic management practices of construction organizations. This paper also introduces the concept of strategic management and the areas that organizations must address to compete in the global marketplace. A summary of an industry survey is documented together with the background research that prompted the investigation of these topics.

INTRODUCTION

The construction industry is one of the driving industries in the world economy. In the United States, construction volume in 1996 was in excess of \$500 billion, with more than 1,000,000 firms operating in the construction sector (*Statistical* 1997). However, in contrast to other manufacturing industries that fabricate a large number of units such as automobiles or personal computers, the construction industry is generally focused on the production of a single and unique end product. The achievement of these unique projects is achieved through what is termed the "project format" (Halpin and Woodhead 1998). In this format, the focus of management is on the planning and control of resources within the framework of the project. While project management topics receive significant focus from construction professionals, less attention is paid to strategic management. In this focus, strategic management addresses the challenges of operating a construction organization as opposed to an individual project. However, because of the extensive emphasis on project management requirements, significantly less attention is given to the unique requirements of strategic management. Specifically, existing literature and research reports provide far fewer avenues for construction professionals to obtain strategic management knowledge (Goodman 1998). In response to this issue, the current research effort was undertaken to examine strategic management practices in the construction industry and identify strategic areas requiring greater attention by the industry.

This paper introduces the findings from a primary component of this study, the characterization of strategic management practices in the construction industry. This paper also introduces the need for this emphasis, the focus group selected for the survey, the data tabulations, and the analysis of the data collected. Finally, the paper addresses the need for action within the industry to achieve a greater level of effectiveness in the area of strategic management.

WHY STRATEGIC MANAGEMENT?

Technology, communication, and market advances are fundamentally changing the global perspectives of time, distance,

and spatial boundaries. Two decades ago organizations could identify themselves as local, regional, national, or international in scope and expect that these definitions were clearly defined. However, with the emergence of technological innovations, these boundaries have been blurred to the point where any organization can theoretically participate in a design or construction project in any location. Concurrently, the concepts of company loyalty, traditional competitors, and employee development are changing at a pace that has not previously been encountered in postindustrial times. Of particular interest is the emergence of three issues that form the need for a strategic management perspective by construction organizations—knowledge workers, new markets, and information technology.

Knowledge Workers

Today's work place is evolving from a skill-based environment to one that is knowledge-based. Originally seen in manufacturing, this transformation focuses on the day-to-day tasks completed by staff personnel. In manufacturing, traditional operations required workers with machinery skills developed over long periods of employment. Knowledge of diverse engineering procedures was not as valuable as the skill required to keep the assembly line moving at each station. In contrast, today's manufacturing facilities are characterized by highly automated machinery featuring robotics, automated vision systems, and artificial intelligence components. Operation of these advanced manufacturing facilities requires workers to operate an automated segment of the facility that formerly was manned by multiple teams of skilled operators. In this manner, manufacturing is transferring from a skill-based economy to one that values knowledge as the key to operational effectiveness. Similarly, the construction industry is witnessing the emergence of knowledge-based tasks as a central focus of organization operations. Previously, professionals were educated in specific disciplines and encouraged to remain with a single employer for an extended period of time in the tradition of professional apprenticeships. However, this trend is changing with the emerging focus on expertise in areas such as technology, automation, economics, and market development. The ability to access information from sources such as the Internet, government and corporate databases, and private agencies has become a critical attribute as information exchange is now a fundamental component of the business operation.

New Markets

A second challenge for the construction industry is the area of emerging markets and competition. Historically, the construction industry has divided markets into the traditional classifications of heavy, industrial, commercial, or residential cli-

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ents. This division provided the opportunity for organizations to entrench themselves into narrowly defined competitive markets. Through this entrenchment, the industry elevated the leaders, challengers, and followers into an organized division of companies that battled for projects in an intense, but ordered, field of competition. Because competition from outside organizations was a secondary concern, security was defined through closely held market areas. Unfortunately, this stability is slowly changing. With pressure increasing on profit margins and market boundaries, the evidence is mounting that construction organizations address alternatives to traditional markets. Boundaries accepted as the limits of market focus can no longer constrain the organization from exploring alternative income opportunities. The entire life cycle of a construction project represents opportunities for professional services. However, the knowledge to identify, find, and pursue these opportunities must be developed as part of an expanded construction organization strategy.

Information Revolution

Although the developments in human resources and markets demand that construction organizations respond to changing circumstances in the employee and customer marketplace, the information revolution is impacting all aspects of the construction profession. Current computing technologies are providing construction professionals with access to rapidly expanding information repositories and evolving communication pathways. This access has profound implications for the construction industry in several areas including intraoffice communications, client relations, and site management. At the core of this transformation is the evolution from hierarchical information transfer to the concept of hyperarchical information access and transfer (Evans and Wurster 1997). Hyperarchical information concepts are breaking communication barriers by allowing any individual to electronically communicate with any other individual, regardless of title, rank, or office. Hyperarchical information access allows any individual to access information repositories anywhere in the world. Advancements in communication technologies are expanding these concepts by bringing project participants together through video, audio, and virtual reality environments. Communication, organization, marketing, human resource, and operational processes are fundamentally changing, and, as such, organizations must re-examine their attention to these technologies as a component of their long-term development.

WHAT IS STRATEGIC MANAGEMENT?

The history of strategy and strategic management covers a broad time line from ancient Greece to the twenty-first century. Organizations, practitioners, and researchers from every sector of the professional world have focused on strategy as a primary topic at some point (Chinowsky 1999a). In contrast to mathematics, physics, or material science, strategy does not contain universal truths that can be documented through scientific theorems and proofs. However, as illustrated through the extensive history of strategic management, scientific and management advancements have been integrally related to the field for centuries. From this development, strategic management encompasses principles from a combination of quantitative and qualitative fields. On the quantitative side, management and industrial sciences have formalized the domains of operations, logistics, and finance. Complementing this quantitative rigor are the human dimensions of psychology, sociology, and human resource management. In combination, these quantitative and qualitative elements address diverse organization needs including professional, technical, and strategic demands.

However, similar to the difficulties that arise when architects, engineers, and constructors are unable to communicate due to incompatibilities in vocabulary, organizations cannot develop long-term plans when members are working from different definitional bases. Reducing uncertainty and miscommunication requires a common understanding and interpretation of foundational concepts. In the field of strategic management, these foundational concepts include strategy, strategic management, strategic planning, and strategic plans.

Strategy Defined

Beginning at the highest level of abstraction, the first strategy concept is that of strategy itself. The basic concept of strategy is that of an idea. Specifically, an idea that sets in place a path that responds to multiple internal and external influences (Porter 1979; Hamel and Prahalad 1989; Collis and Montgomery 1991). In contrast to the execution and control plans developed for individual projects, strategies are concepts that contain no intrinsic steps to achieve the final destination. Originally developed by rulers and military leaders attempting to broaden their empires, the concept of strategy can be traced to the beginnings of recorded history. Examples of strategies that remain a part of today's vocabulary or military foundation include the use of the Trojan Horse, the development of the warship, and the concept of the fortified castle. Each of these examples represented a new approach that responded to a current situation, predicted the needs of the future, or presented a new method for achieving a goal. Similar to the expansion of political empires, the expansion of business entities requires organizations to take proactive steps for both existing and anticipated industry conditions. The modern business interpretation of this concept is exemplified in industries as varied as telecommunications and grocery chains. The expansion of digital communications, global mergers, and the introduction of lean production have modified business practices to anticipate twenty-first century scenarios. These ideas are not implementation plans, but rather the visions from which specific action plans are being developed. In this context, strategy is defined as the underlying concept that responds to, or anticipates, industry conditions for the purpose of developing long-term plans.

Strategic Management—Environment for Strategy

The development of strategic concepts, whether from a military perspective or a modern business perspective, does not occur spontaneously. The development of strategic concepts requires an environment that fosters strategic thinking and focus. The establishment, continuation, and enhancement of this environment is the focus of strategic management. Strategic management models have been evolving in the business domain on a continuous basis since the late nineteenth century. Combining input from these models with the results of interviews conducted by the writers with civil engineering executives, the current study proposes that strategic management in the context of the construction industry comprises the following seven areas:

- Vision, Mission, and Goals—The starting point for all organization endeavors; establishing a vision provides each member with a direction to follow in all business practices.
- Core Competencies—The business boundaries for an organization; core competencies establish what an organization does best and where its strength resides.
- Knowledge Resources—The combination of human and technology resources that provide the backbone for completing organization projects.

- Education—A focus on the information and formal requirements for lifelong learning and understanding of evolving business conditions.
- Finance—A broad focus on monetary concerns beyond the project-to-project concerns of budget and schedule control.
- Markets—The analysis of expanded business opportunities within domains that are related to core competencies.
- Competition—A focused analysis and understanding of existing, emerging, and future competitors in both existing and potential market segments.

As illustrated in Fig. 1, the seven areas of strategic management can be pictured as a series of segments within an overall structure. Rather than viewing the structure as a linear segment, the illustration is circular to indicate that strategic management activities are a constant process that return to the beginning at regular intervals to ensure that a constant focus is retained on the core purpose of existence. Underlying this entire structure is the understanding that the purpose of these focal points is to provide the environment that allows organizations to formulate strategic concepts.

Strategic Planning—Implementation Side of Strategy

Strategy management provides the environment that encourages the development of strategic concepts. However, just as strategic concepts do not usually develop spontaneously, the existence of a strategic management environment does not guarantee that organization members will focus on developing strategic concepts. To encourage this focus, numerous academic and business writers have proposed various strategic planning models (Davis 1987; McCabe and Narayanan 1991; Mintzberg 1994; Lemmon and Early 1996; Thompson and Brooks 1997). These strategic planning models provide specific instructions for approaching, executing, and evaluating the development of strategic concepts. For example, a common model emphasizes the need for an organization to (1) build a strategic planning team; (2) set the strategic planning objectives; (3) gather member input; (4) synthesize the developed ideas; (5) develop an implementation plan; (6) execute the plan; and (7) evaluate the success of the ideas prior to the start of the next strategic planning time frame. However, as with any topic that focuses on procedural processes, the number of strategic planning methods is increasing at a rate that sometimes appears to be exponential. As such, the strategic

planning process is slowly becoming synonymous with the entire field of strategy. This connection is incorrect. The strategic planning process is one element of the overall strategy topic. Strategic planning is the focused attention to the development of strategic concepts based on the inputs provided by the seven areas of strategic management.

Strategic Plan—Putting It All Together

The previous strategy elements combine to focus a construction organization in a particular direction for a particular planning period. Although this strategic direction is a major milestone for the strategic planning process, it is not the final conclusion required for implementation purposes. Rather, a strategic plan is required to outline the goals, objectives, mileposts, and evaluation criteria that must be followed to achieve the developed strategy. However, translating a strategy into a series of tasks that can be accomplished by individual departments is challenging. The time required to focus on broadening client bases, or examining new revenue streams, is often overridden by demands by projects for attention to budget, schedule, or personnel matters. Given this conflict for attention, a specific set of instructions is required to ensure that an organization remains focused on organization-level concerns. This set of instructions is the strategic plan. Encompassed within this plan are the measurable outcomes that both division and organization-level managers can evaluate for progress and final achievement.

CURRENT STUDY

The development of a survey to obtain data from construction organizations on strategic management processes is an extension of a larger study overseen by the writers. In the larger effort, an attempt is being made to identify the areas of strategic concern for civil engineering organizations and to develop an appropriate strategic management process for these organizations to implement and measure. In response to the first component, a 3-year study was conducted to determine what topics were identified by researchers and executives as the key strategic elements for the civil engineering industry. In this process, a content analysis methodology was employed on 574 papers from management and civil engineering journals to initially identify topics of common concern (Goodman 1998). Concurrently, over 50 personal interviews were conducted with civil engineering executives (vice-president level and above) to correlate the research data with actual experiences (Chinowsky 1999b). Combining the input from these studies provided the basis for the seven strategic management areas identified in the previous section.

The identification of the strategic management concerns provided a basis on which to formally survey a segment of the industry. The segment selected for the initial survey effort was the 1998 ENR Top 400 Contractors (ENR 1998). This population was selected for two reasons: (1) It is an accepted measurement and list within the construction industry; and (2) the organizations within the list span a significant revenue span that, it was hypothesized, should be reflected in varied management practices. The specific individuals within the organizations that were identified for the survey were executive-level individuals who were responsible for organization-level concerns.

Once the topics and organizations were identified, the survey illustrated in Appendix I was mailed to the 400 organizations. It should be noted at this point that the intent of this survey is not to characterize the strategic management practices in the construction industry as a whole. A second survey effort addressing management practices of smaller organizations will follow shortly to obtain a broader industry perspective.

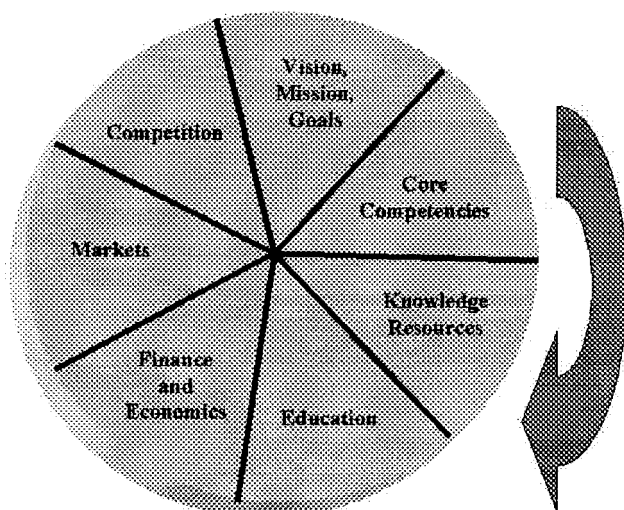


FIG. 1. Seven Areas of Strategic Management Work in Cyclical Procedure, Each Providing Feedback and Reinforcement to the Process

tive. However, the current study provides a perspective on the strategic management practices in the top organizations as ranked by revenue.

Response Rate

The response rate for the first 400 questionnaires was 26.5% (106 responses). A second group of questionnaires was faxed to the organizations that did not respond to the initial survey. From this second group, an additional 27 responses were received (9%). Together, the first and second groups totaled 133 responses, or 33% of the ENR Top 400. A summary of the responses and percentages is provided in Appendix I.

The respondents answering the survey all satisfied the criterion of holding an executive position. Of these respondents, 22 identified themselves as vice presidents, 1 as a secretary, and the remaining individuals identified themselves as president, chairman, or CEO. The respondents had an average length of tenure with their current organizations of 21.3 years and an average length of time as an executive of 17.1 years.

To facilitate the analysis of the survey data, the 400 organizations were divided into five quintiles of 80 organizations each. This division provided the opportunity to group organizations with similar revenue streams into a single category. Once these groupings were created, the five groups could be analyzed to determine if the size of the organization has statistical significance in terms of differences in survey response. Table 1 illustrates the survey groups established for this study and the corresponding response rates obtained in each category.

SURVEY RESULTS

To present the analysis of the survey results, the analysis is divided into three overall categories—general perspectives, internal issues, and external issues. In each of these categories, the following discussions present a description of the category, the data obtained from the survey, and a summary of the statistical significance derived from the survey data.

General Perspectives

The first category of interest for the survey effort was an initial query concerning each organization's practices in long-term planning. As illustrated in Appendix I, Question G asked the respondents what long-term planning period is used in the organization. The result of this question indicated a population trend for an advanced planning window of 3–4 years. Although Group 1 had a slightly higher average planning period response with the only category average exceeding 4.0 (Table 2), the statistical analysis indicates no statistical difference between the five groups (Table 3).

Question H built upon Question G by asking the respondents to provide an indication of how strategic planning has been integrated into the organization. As illustrated in Appendix I, this is the first question to introduce the 1–7 answer scale employed in the survey. This scale provides a series of discrete implementation stages for respondents to indicate the current status of their organization's strategic management efforts. Starting at a value of 1 that indicates the organization is not aware of the concept to a value of 7 that indicates full implementation and measurement of a concept, the seven values provide the opportunity for an organization to respond with their current status in terms of a specific strategic management concept. Rather than focusing on the amount of resources committed to the area, the focus of the scale is on the degree of implementation. From this perspective, Question H asks the respondents to indicate the status of overall strategic planning in the organization.

TABLE 1. Quintile Breakdown of Survey Groups

Group (1)	Ranking range (2)	Revenue range (in millions) (3)	Number of respondents (4)	Percentage of group (5)	Percentage of overall survey (6)
1	1–80	341–10,798	28	35.0	21.0
2	81–160	175–340	21	26.0	16.0
3	161–240	123.3–173.8	34	42.5	25.5
4	241–320	91.5–123	24	30.0	18.0
5	321–400	64.3–90.7	26	32.5	19.5
Total			133		100.0

TABLE 2. Quintile Averages for Internal Strategic Management Issues

Group (1)	Question (2)	Response mean (3)	Standard deviation (4)
1	G	4.3	1.5
	H	5.3	1.7
	L	4.1	1.7
	M	5.8	1.2
	N	4.0	1.8
2	G	3.6	1.3
	H	5.0	1.5
	L	4.0	1.6
	M	5.5	1.6
	N	3.3	1.4
3	G	3.5	1.3
	H	5.3	1.6
	L	3.7	2.1
	M	5.2	1.6
	N	3.8	1.8
4	G	3.4	1.2
	H	5.7	1.4
	L	3.1	1.8
	M	5.6	1.2
	N	4.3	2.1
5	G	3.5	1.1
	H	4.9	1.6
	L	3.7	2.0
	M	5.1	1.6
	N	3.0	1.9

TABLE 3. Statistical Analysis of Average Response and Criticality of Size of Organization on Response Average

Question (1)	Respondent average (2)	χ^2 (3)	Criticality factor ^a (4)
G	3.6667	28.76718	31.410
H	5.2615	14.94701	36.415
I	1.4242	10.01189	9.488
J	1.2595	1.68270	9.488
K	1.1860	1.28881	9.488
L	3.7293	26.35113	36.415
M	5.4167	21.96148	36.415
N	3.6977	30.50781	36.415
O	4.3953	18.70336	36.415
P	4.9699	25.15135	36.415
Q	4.6917	17.44993	36.415

^a χ^2 number must exceed the criticality factor to indicate statistical significance.

As illustrated in Table 3, the results of Question H indicate that the industry average for the question is 5.26. This number reflects the perspective that management is predominantly in the initial or preliminary stages of implementing strategic planning within construction organizations. As further documented in Table 3, no statistical difference exists in the responses between the five groups. Additionally, the dispersion of answers within the five groups as indicated by the standard deviation is similar between each quintile (Table 2). Therefore, as will

be seen repeatedly throughout the following sections, the size of the organization has little impact on the state of strategic management practices within the organization.

Internal Issues

The second category of interest in the strategic management survey is internal issues. In approaching the strategic management process, a fundamental division can be made between issues that are internal to an individual organization and issues that force a response to external forces. Questions I–N each focus on internal issues that emphasize the approach an organization takes to support the development of resources and long-term plans. The first of these questions, Question I, asked the respondents to indicate whether or not the organization had a vision statement. This question, together with Questions J and K, emphasize the organization's focus on developing a long-term road map for the organization development. The vision component of this road map establishes the ultimate goal for the organization to achieve. As indicated in Appendix I, 58% of the total respondents indicated that their organizations have a vision statement. Of interest in this response is the fact that Question I had the only indication of size as a statistically significant difference between the respondents (Table 3). In this case, the larger the organization, the more likely it is to have a vision statement. Specifically, the respondents increase from a low of 42% of the organizations having a vision statement in Group 5 to a high of 82% in Group 1 (Table 4).

Complementing the results generated from Question I are the results generated from Question J. In this second internal question, the respondents are asked to indicate the existence of a mission statement within the organization. The focus of this question is to determine if the organization has determined how they are going to achieve the stated vision. As indicated in Table 3, the response to this question returned to the uniformity discussed previously. Across the sample, 73% of the respondents indicated the existence of a mission statement (Appendix I). In contrast to the vision statement, no statistical difference was noted between the groups. Finally, Question K completed the group of three questions relating to establishing long-term goals and direction. In this question, the respondents were asked if they had established specific goals that would assist the organization reach their strategic objectives. Once again, the number increased as 82% of the respondents indicated the establishment of short-term objectives (Appendix I).

The second focus of the internal issues component of the survey focused on the incorporation of the core competencies concept into the organization. The focus of Question L was on the emphasis that organizations are giving to their internal strengths and the use of these strengths as building blocks for

market development. As indicated in Table 3, size was not a factor in the responses given. The overall average for the question was 3.7, indicating that a plan to focus the organization on core competencies either is in the conceptual stage of development or has been developed but not as yet moved to the implementation stage. An interesting note in the response rate for this question is the dispersion in the answers as indicated by the standard deviation (Table 2). With an average greater than any other question, the standard deviation for each group approached 2.0. This standard deviation reflects the variability in responses received for this question. Although the average was 3.7, it was just as likely for an organization to respond with a 2 or a 6. More than any other issue in the survey, the respondents indicated that the core competency concept had a wide variability in use through the industry.

The third internal focus emphasized a move toward new technologies as a tool to facilitate knowledge exchange between organization employees. Rather than focusing on computer tools that facilitate the completion of existing tasks such as scheduling and estimating, Question M queried the respondents on their focus on the future. Specifically, Question M emphasized the use of the Internet as a tool to facilitate organization employees working together through the exchange of knowledge. As indicated in Table 3, the response to this question was a stark contrast to Question L. Whereas the average for Question L was 3.7, the average for Question M was 5.4, the highest in the survey. The dispersion in the responses was similarly low at 1.2 or 1.6 (Table 2). This average and dispersion indicates that the use of the Internet is rapidly entering into the strategic plans of construction organizations, with the average organization currently focusing on the implementation of a strategic technology plan.

The final focus on internal strategic issues was reflected by Question N. In this question, the organization focus on long-term education was analyzed by asking the respondents about the focus on procedures to support lifelong learning. The emphasis of this question was to focus the respondents on the move to organization learning, or the need for all individuals in the organization to continue their education throughout their careers. Although most of the respondents indicated some level of education was taking place in the organization, Question N revealed a strong focus on craft training rather than lifelong learning. As indicated in Tables 2 and 3, the average response to this question was 3.7, with a low of 3.0 and a high of 4.0. Once again, statistical significance to organization size was not found to be evident. However, a high dispersion in response was once again detected as organizations were found to be in the opposite direction as that taken toward technology integration. Whereas technology integration was found to be in the implementation stage, lifelong learning is predominantly in the conceptual stage of development.

External Issues

The final category of interest in the strategic management survey was the focus on external issues by construction organizations. In contrast to internal issues such as organization learning that can be addressed exclusively within the confines of the organization, external issues address factors that are industry-based rather than organization-based. Specifically, Questions O–Q address the response by organizations to the changing market and business forces occurring in the construction industry.

The first external issue of concern was the response by organizations to the economic swings that occur in the construction industry. Question O asked the respondents to indicate the organization status in developing a long-term response to economic variability by putting in place procedures to forecast and anticipate economic changes. As indicated in Table 3, the

TABLE 4. Quintile Percentages for Vision, Mission, and Goal Questions

Group (1)	Question (2)	Yes (3)	No (4)
1	I	82	18
	J	70	30
	K	86	14
2	I	57	43
	J	78	22
	K	81	19
3	I	52	48
	J	79	21
	K	77	23
4	I	54	46
	J	75	25
	K	86	14
5	I	42	58
	J	65	35
	K	80	20

TABLE 5. Quintile Responses for External Strategic Management Questions

Group (1)	Question (2)	Response mean (3)	Standard deviation (4)
1	O	4.5	1.7
	P	5.3	1.3
	Q	4.8	1.5
2	O	4.1	1.9
	P	4.7	1.6
	Q	4.2	1.8
3	O	4.4	2.0
	P	5.0	1.7
	Q	5.0	1.7
4	O	4.6	1.9
	P	5.0	1.8
	Q	5.0	1.7
5	O	4.3	1.8
	P	4.7	1.5
	Q	4.3	1.6

average response to this question was a 4.4. The size of the organization did not prove to be a deciding factor in this response, and the dispersion in responses remained relatively equal throughout the survey participants. However, it should be pointed out that the dispersion was once again high at almost 2.0 (Table 5). This dispersion indicates a wide range of answers, with some organizations actively implementing plans and other organizations choosing to follow the twists and turns of the marketplace. Taken as an overall average, construction organizations have recognized the impact of economic swings and are attempting to develop action plans that will reduce the impact of these swings on long-term operations.

The second issue of concern for organizations from external forces is the impact of new market opportunities on existing business practices. The central emphasis in this area is the identification of new market opportunities as a basis for expanding current market segments. This emphasis is important for organizations that are attempting to develop strategic plans that consider the expansion of market segments as a key component in increasing profits and reducing the pressure from existing competitors. Question P addressed this issue by asking respondents to indicate their organization's status in proactively identifying new and expanded market opportunities. Similar to the focus on technology, construction organizations are making considerable progress in this area of strategic management. The average score for the respondents in this category was a 5.0 with little dispersion being evident in the groups (Tables 3 and 5). These responses indicate that the pursuit and analysis of new markets is receiving implementation-level attention with many organizations developing evaluation measures for their market entry efforts.

The final issue of concern for external issues, protecting against competitors, also serves as the final area of concern for the strategic management survey. The proliferation of new competitors entering the construction arena is creating competition from areas such as management consultants, which were rarely considered threats only a decade ago. However, the long-term outlook for this competition indicates continued growth from these new competitors and, therefore, a need for existing organizations to protect existing market share. In response to this issue, Question Q asked respondents to indicate organization efforts to position against new competitors. As indicated in Table 3, the response to this question demonstrated a slightly lower implementation stage than that identified for Question P, with an average of 4.7 versus 5.0 for the previous question. Although the responses do not have a statistical significance in terms of organization size, it is interesting to note that Groups 3 and 4 had the highest average for

this question (Table 5). Although statistically it is difficult to make a conclusion from this data, anecdotal evidence from associated interviews indicates that organizations in these lower revenue groups have established a greater awareness of the need to protect existing business from market competitors.

ANALYSIS

The results of the strategic management survey provide a basis for analysis in the following areas: (1) Strategic areas that the industry is addressing in a positive manner; (2) strategic areas that the industry needs to address with greater emphasis; and (3) the impact of size on strategic management practices.

Positive Strategic Management Areas

The strategic management survey provides positive indications in two areas—technology and market awareness. In technology, construction organizations in each of the quintiles indicate that the integration of technology to support knowledge transfer between members is an area that is receiving significant attention. With 57% of the respondents indicating that technology integration is either in the full implementation or measurement stage, technology integration moves to the forefront of strategic issue awareness. This action-oriented approach to technology integration is imperative when the impact of the latest information technology revolution is considered. As discussed at the beginning of this paper, the new wave of information technology capabilities in transforming the manner in which construction organizations will conduct business in the twenty-first century. The Internet and virtual office environments will become an accepted fact for future project environments (Fruchter 1997). Responding to these changes by implementing technology strategies ahead of the competition provides the opportunity to evaluate the impact of technology and implement a strategy that has the best potential to result in a positive outcome.

Similar to the positive focus on technology, the construction industry respondents demonstrate an awareness of the need for market expansion. With 44% of the respondents indicating that market opportunity identification was in a full implementation or measurement stage, this question reflects the strong competition that exists in the construction industry. Understanding that a continued focus on a narrow market creates a scenario where the organization becomes vulnerable to market shifts (e.g., the nuclear sector), construction organizations are increasingly focusing on the need to identify and enter new market segments. As indicated by the lack of statistical significance attributed to organization size, this market focus is understood by organizations at every level. However, this result should not be extrapolated to infer that all organizations are entering appropriate markets. The survey did not inquire as to the types of markets that organizations were investigating. Rather, the analysis can state that construction organizations are aware of the need to strategically position themselves in new markets to respond to market shifts, and actions are being taken to establish these new positions.

Areas for Greater Emphasis

In contrast to the positive results obtained in the strategic management survey for the technology and market areas, the responses in two areas, education and competitive positioning, indicate a need for greater strategic emphasis. The first of these areas, education, demonstrates the broadest need for greater strategic emphasis. Although it was unanimous among all respondents that some type of education was taking place in the organization, the majority of organizations do not incorporate

the concept of lifelong learning. With 36% of the respondents indicating that the concept is unfamiliar or no plan of action is in development, lifelong learning received the lowest focus of the strategic management issues. In contrast to the writers' assumptions prior to the study, the size of the organization does not factor into this response. Although organizations in the Group 1 category indicate a greater institutional focus on craft and entry-level training, the emphasis on lifelong learning received no greater emphasis than that indicated by organizations in Group 5. This trend is consistent throughout the respondents. Although the need for craft and field education is apparent, less attention is being given to continuing the education opportunities of middle- and upper-level employees.

The second area that the survey results indicate a need for greater emphasis is that of competitive positioning. Although the surveyed organizations appear to recognize the importance of new markets and opportunities, these same organizations are having a difficult time identifying ways to protect existing market positions. Although Porter (1979) stressed the need for organizations to protect against existing competitors and new entrants, this concept requires emphasis for the strategic planning of construction organizations. Specifically, construction organizations must acknowledge the fact that very few barriers exist to prevent new entrants from entering many segments of the market. Similarly, the same opportunities that exist for one organization to expand market presence into a new sector also exist for outside organizations to threaten the same organization. In this manner, market analysis and competitive positioning must become two halves of a common whole. Unfortunately, the current survey indicates that 43% of the respondents recognize the need for competitive positioning but have not fully implemented a competitive positioning strategy. This number contrasts with the 44% of the respondents who have fully implemented the market opportunity segment of their long-term strategy.

Impact of Size

Any research in the construction industry cannot ignore the fact that the industry comprises many more small organizations than large organizations. Based on Census Bureau statistics, there are approximately 206,000 general and heavy contractors in the United States (*Statistical* 1997). The top 400 contracting firms account for only 0.2% of the contracting population. However, these same contractors account for over 30% of the annual revenue generated by general and heavy contractors. Given this difference in size, different forces will act upon these organizations. Similarly, the writers believed prior to this survey being conducted that these same differences would exist between the top revenue generating group in the survey and the bottom group. Given that the average revenue for the respondents from Group 1 was \$968,000,000 and the average for the respondents in Group 5 was \$77,000,000, the hypothesis was developed that statistical differences should appear between the quintiles. However, as detailed in the data sections, these statistical differences did not appear. Rather, except for the vision statement question, no other question was found to have the size of the organization as a statistically significant variable. The same strengths and weaknesses were found in every quintile. Uniform strength was found in technology and markets, whereas uniform weaknesses were found in education and competitive positioning. Similarly, the dispersion in the responses was uniform across the survey. In areas such as core competencies and financial risk analysis, dispersion was high in each group, and areas such as planning periods and technology had uniformly low dispersion. In summary, the strategic management survey disproved the initial research hypothesis and indicated that stra-

tegic management practices are statistically similar throughout the top 400 contractors.

CONCLUSIONS

The first step in the process of moving to a strategic management perspective is to determine where current strengths exist, where gaps exist, and where the priorities will be set to build upon these answers. An organization should not be discouraged if it finds one or more areas have significant gaps at the present time. Every organization has room to improve. The difference between the organization that is destined to succeed and the one that is destined to ride the waves of the marketplace is the desire to fill these gaps. At the same time, the organization needs to be realistic about its efforts to fill these gaps. In some instances, significant investment is required to move forward toward strategic objectives. In these instances, the organization must set priorities and balance available resources. For example, if an organization finds itself with gaps in education and competitive analysis, then a decision must be made as to which of these gaps requires the greater attention at the current time. Because each of these gaps will require an investment of time, planning, and monetary resources, the organization must determine where the resources will be allocated. However, this process does not have to be an either-or situation. Rather, advancement in each area is an appropriate response. In this example, that response may be to establish a lunch-time seminar series with in-house personnel (a low-cost action to address education concerns), while at the same time investing in a team to analyze the current competitive situation in an identified market expansion area (a larger resource commitment, but one that is considered critical to long-term success by the organization).

Similar to the balancing of resources on a project, the balancing of resources at an organization level is required to keep an organization on a continued path of advancement. Rather than advancing an individual area, leaders must retain an overall perspective acknowledging that each of the seven strategic management areas are equally important to achieving a long-term vision. Specifically, implementation cannot be undertaken without a focus on where the actions are ultimately intended to lead. Similarly, strategic goals must be evaluated on a regular basis and with the same rigor as applied to project objectives.

Often overlooked by organizations, except in the context of market share or revenue projections, strategic evaluation emphasizes the need to evaluate the progress of each strategic management component on a regular basis. Similar to the current emphasis on business development evaluation, strategic management evaluation is required to determine progress toward achieving strategic objectives. However, in contrast to the business development evaluation, strategic management evaluation may not be quite so clear and well defined. Items such as education and core competencies cannot be measured in terms of dollars and market share. Rather, these strategic management issues need to be evaluated in terms of organization progress and movement toward an ultimate goal. For example, an organization that sets the goal of increasing the focus on core competency operations may not be able to place a dollar return on that specific objective. However, that does not translate into a failure of ability to evaluate progress toward that goal. Rather, the evaluation criteria must be altered to fit the criteria. In this case, the criteria may be the increase in clients requesting services related to the core competency, or the number of new hires related to the core strengths. In either case, the evaluation criteria focus less on dollars and more on building a foundation for long-term success.

The strategic management survey illustrated that construc-

tion organizations are taking steps to increase this focus on strategic management issues. However, progress in several areas is still required. Undertaking the moves required to achieve this progress may be painful for some organizations, but this discomfort should be tempered by the thought that the organization is setting in place a road map for the future. In contrast to organizations that ride the waves of the marketplace,

the organization that institutes a strategic management perspective will be setting its own direction and path through the changing waters of the market. It is through this independence, aggressiveness, leadership, and vision that organizations will move to the forefront of the construction industry and ensure themselves an opportunity to respond to the constant changes in the global marketplace.

APPENDIX I. SURVEY INSTRUMENT

Name _____
 Title _____
 Organization _____

Strategic Management Survey

First, we would like to ask you some questions about yourself.

A. How long have you been with the company?

_____ YEARS 21.32 Years (Average)

B. List your degrees obtained and major field of study.

_____ Bachelor	_____ Field of Study
_____ Master	_____ Field of Study
_____ PhD	_____ Field of Study

C. What is your experience background?

_____ YEARS AS FIELD AND/OR OFFICE ENGINEER
 _____ YEARS AS PROJECT MANAGER
 _____ YEARS AS EXECUTIVE (vice president and above)

Next, we would like to ask you some questions about your organization.

D. How many full-time employees are in your organization?

_____ NUMBER

E. Please rank the following business sectors in which your business operates (rank all that apply).

_____ General Building	_____ Petroleum
_____ Transportation	_____ Power
_____ Manufacturing	_____ Environmental
_____ Industrial Process	_____ Telecommunications

F. How is your business organized (e.g. business segments, geographic location, regional divisions)?

Next, we would like to ask you some questions about corporate management.

Several of the following questions request that you respond with an answer from a scale from 1-7. The numbers in the scale correspond to the following definitions. Please use these for each of the scaled questions.

1. Not aware of the concept
2. The organization is aware of the concept or issue, but no action has been taken
3. An action is in the conceptual stage of development
4. A formal action plan has been developed
5. The action plan has been initially or preliminarily implemented
6. The action plan is in full implementation
7. Evaluation measures are in place to check the progress or success of the action plan.

G. How far ahead does your company plan for strategic initiatives?

<1 Year	1-2 Years	2-3 Years	3-4 Years	4-5 Years	5+ years
Response 2%	15%	39%	16%	17%	12%

H. Have you incorporated the concept of strategic planning into your organization? (Circle Your Answer)

	1	2	3	4	5	6	7
Response	0%	7%	12%	8%	25%	28%	28%

I. Has your organization developed a vision statement?

_____ YES _____ NO
 Response 58% 42%

(if yes) please state the vision statement or attach a copy

APPENDIX I. (Continued)

J. Has your organization developed a mission statement?

	YES	NO
Response	73%	27%

(if yes) please state the mission statement or attach a copy

K. Has your organization developed short-term objectives to achieve the stated vision and mission?

	YES	NO
Response	82%	18%

L. Have you incorporated the concept of core competencies in your organization?

	1	2	3	4	5	6	7
Response	13%	22%	14%	11%	20%	14%	6%

M. Is your organization using Internet-based technologies (e.g. World Wide Web) to facilitate information and knowledge exchange between your professional staff?

	1	2	3	4	5	6	7
Response	2%	4%	8%	6%	24%	33%	23%

N. Has your organization put in place procedures for lifelong learning?

	1	2	3	4	5	6	7
Response	10%	26%	16%	12%	11%	19%	6%

Please list most frequently used education methods.

1. _____
2. _____
3. _____

O. Is your organization conducting financial risk analysis to forecast and protect your organization from economic swings?

	1	2	3	4	5	6	7
Response	3%	22%	10%	12%	18%	20%	15%

P. Is your organization conducting market analyses to proactively identify new and expanded organization opportunities?

	1	2	3	4	5	6	7
Response	1%	12%	7%	11%	26%	26%	17%

Q. Is your organization proactively positioning itself to protect against new competitors?

	1	2	3	4	5	6	7
Response	2%	14%	10%	11%	22%	29%	11%

Finally, we are interested in your additional thoughts on these issues.

S. Is there anything else you would like to tell us which might help in our future efforts to understand how executives feel on these issues (please attach additional pages if necessary)?

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