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STRATEGIC MANAGEMENT IN ENGINEERING ORGANIZATIONS

By Paul S. Chinowsky¹

ABSTRACT: The traditional philosophy of management in organizations that focus on the built environment, both in the public and private sector, places great emphasis on the ability to plan and execute projects. In contrast, a similar emphasis on strategic management has received less attention in this context. This paper introduces a comparative study of the current strategic management practices in public and private organizations that are responsible for constructing the built environment. The paper introduces the areas that organizations must address to compete in the face of changing customer and competitor conditions. A summary of a comparative survey conducted on firms in the construction industry is documented together with the background research that prompted the investigation of these topics.

INTRODUCTION

The history of strategy and strategic management covers a broad timeline 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 2000). As a central component of long-term planning, the development of strategies is integrated into every facet of business organizations. However, the development of these strategies does not occur spontaneously. The development of strategic concepts requires an environment that fosters strategic thinking and focus. However, in contrast to manufacturing organizations that focus on the long-term viability of a product, the construction industry is generally focused on the production of a single and unique end product. While this project-based focus receives significant consideration from construction professionals, less attention is paid to strategic, or enterprisewide, management issues. 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 both public and private organizations involved in developing the built environment 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 public and private organizations focused on the built environment. The paper introduces the need for this emphasis, the focus groups selected for the survey, the data tabulations, and the analysis of the data collected. Finally, the paper addresses the need for action

within these organizations to achieve a greater level of effectiveness in the area of strategic management.

STRATEGIC MANAGEMENT AND PLANNING

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 writer with civil engineering, construction, and public agency 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 strengths reside.
- Knowledge resources—The combination of human and technology resources that provide the backbone for completing organization projects.
- Education—A focus on the informal 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.

These seven strategic management areas can be pictured as a series of segments within an overall structure. Rather than viewing the structure as linear, the structure should be envisioned as circular to indicate that strategic management activities are an iterative process that return to the beginning at regular intervals to ensure that a constant focus is retained on the core purpose of existence.

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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.

The development of this strategic management focus should not be confused with the implementation of a strategic planning process. Strategic 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 timeframe.

Similar to 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 exercise of developing strategic concepts based on the inputs provided by the seven areas of strategic management. The focus of the current study is on the implementation of strategic management practices in public and private engineering organizations.

THE CURRENT STUDY

The development of a survey to obtain data from construction organizations and public agencies on strategic management processes is an extension of a larger study overseen by the present writer. In the larger effort, an attempt is being made to identify the areas of strategic concern for organizations related to developing and constructing the built environment and to develop an appropriate strategic management process for these organizations to implement and measure. In response to the first component, a three-year study was conducted to determine what topics were identified by researchers and executives as the key strategic elements for organizations in this population. 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, more than 50 personal interviews were conducted with civil en-

gineering executives (vice-president level and above) to correlate the research data with actual experiences (Chinowsky 1999). 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) and the DOT and environmental protection department (EPD) (or equivalent EPD) in each of the 50 states. Subsequent study has been conducted on the top 500 design firms, a sample of small construction firms, and the *Fortune 500* organizations as an industry benchmark. However, the current paper addresses the initial effort as a basis for the strategic management research. The construction 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 range that, it was hypothesized, should be reflected in varied management practices. The public agencies were also selected for two specific reasons: (1) these agencies interact with the private design and construction sector on a daily basis; and (2) many of the construction-oversight functions within these agencies remained consistent throughout the states. The specific individuals within the organizations that were identified for the survey were executive-level individuals who were responsible for organization-level concerns.

Response Rate

Once the topics and organizations were identified, the survey illustrated in Fig. 1 was mailed to the 400 construction organizations and 100 agencies. The response rate for the 400 construction organizations totaled 133 responses, or 33% of the ENR top 400, after a first-round mail and second-round fax delivery. Concurrently, a 50% response rate was achieved from both the DOT and EPD surveys. A summary of the responses and percentages is provided in Fig. 1.

The respondents answering the survey all satisfied the criterion of holding an executive position. Of the construction company respondents, 22 identified themselves as vice-presidents, one as secretary, and the remaining individuals identified themselves as president, chairman, or chief executive officer (CEO). Of the agency respondents, 27 identified themselves as heads of agencies, with the remaining respondents primarily identifying themselves as department heads or planning specialists. The private industry 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. The public agency respondents had averages of 6.9 (DOT) and 10.5 (EPD) years for the same measurements.

To facilitate the analysis of the survey data, the organizations and agencies were retained in their three respective groups. Retaining these groupings allowed the three

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
 Construction Companies: 21.32 Years Average
 DOTs: 6.88 Years Average
 EPDs: 10.54 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
Private	2%	15%	39%	16%	17%	12%
DOTs	0%	4%	16%	12%	8%	60%
EPDs	8%	20%	20%	8%	28%	16%

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

	1	2	3	4	5	6	7
Private	0%	7%	12%	8%	25%	28%	28%
DOTs	0%	4%	12%	8%	28%	28%	20%
EPDs	0%	8%	8%	4%	16%	12%	44%

FIG. 1(a). Sample Survey with Results

I. Has your organization developed a vision statement?

	YES	NO
Private	58%	42%
DOTs	80%	20%
EPDs	92%	8%

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

J. Has your organization developed a mission statement?

	YES	NO
Private	73%	27%
DOTs	100%	0%
EPDs	100%	0%

(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
Private	82%	18%
DOTs	100%	0%
EPDs	100%	0%

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

	1	2	3	4	5	6	7
Private	13%	22%	14%	11%	20%	14%	6%
DOTs	4%	32%	16%	4%	28%	8%	4%
EPDs	12%	40%	20%	4%	12%	4%	4%

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
Private	2%	4%	8%	6%	24%	33%	23%
DOTs	0%	8%	4%	4%	48%	24%	12%
EPDs	0%	4%	4%	0%	28%	44%	16%

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

	1	2	3	4	5	6	7
Private	10%	26%	16%	12%	11%	19%	6%
DOTs	4%	20%	28%	12%	20%	16%	0%
EPDs	0%	28%	24%	8%	4%	24%	8%

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

	1	2	3	4	5	6	7
Private	3%	22%	10%	12%	18%	20%	15%
DOTs	12%	8%	4%	8%	28%	20%	16%
EPDs	12%	32%	8%	0%	12%	12%	12%

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

	1	2	3	4	5	6	7
Private	1%	12%	7%	11%	26%	26%	17%
DOTs	0%	0%	12%	24%	36%	24%	4%
EPDs	0%	16%	12%	8%	12%	32%	12%

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

	1	2	3	4	5	6	7
Private	2%	14%	10%	11%	22%	29%	11%
DOTs	4%	8%	4%	12%	24%	32%	16%
EPDs	8%	16%	16%	8%	8%	12%	20%

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)?

FIG. 1(b). (Continued)

groups to be analyzed to determine if the type of 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 Fig. 1, the planning period question (question G) asked the respondents what long-term planning period is used in the organization. The result of this question provided the first statistically significant response among the organizations (Table 2). Whereas the response indicated a population trend among the EPD and private organizations of an advanced planning window of between 2–3 and 3–4 years, the DOT respondent average indicated a 4–5 year planning window. As indicated by the planning materials included by many DOT respondents, this 5-year planning window is a critical component of their planning process due to external political forces.

The strategic planning question (question H) built upon the planning window question by asking the respondents to provide an indication of how strategic planning has been integrated into their organization. As illustrated in Fig. 1, 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 planning 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.

TABLE 1. Percentage Breakdown of Survey Groups

Group (1)	Number of respondents (2)	Percentage of group (3)	Percentage of overall survey (4)
Construction Organizations	133	33.3	72
DOTs	25	50.0	14
EPDs	25	50.0	14
Total	183	—	100.0

From the perspective of the implementation scale, the strategic planning question asks the respondents to indicate the status of overall strategic planning in the organization. As illustrated in Table 2, the results of the strategic planning question indicate that the average among all three groups is very similar, ranging from 5.24 to 5.61. This number reflects the perspective that management is predominantly in the initial or preliminary stages of implementing strategic planning within their organizations.

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, vision statement (question I), asked the respondents to indicate whether or not the organization had a vision statement. This question, together with the mission statement and objectives questions (questions J and K), emphasizes the organization's focus on developing a long-term roadmap for the organization development. The vision component of this roadmap estab-

TABLE 2. Statistical Analysis of Average Response and Criticality of Size of Organization on Response Average

Question (1)	Construction respondent average (2)	DOT respondent average (3)	EPD respondent average (4)
Planning period ^a	3.6667	5.040	3.760
Strategic planning	5.2615	5.240	5.609
Vision statement	1.4242	1.200	1.080
Mission statement	1.2595	1.000	1.000
Objectives	1.1860	1.040	1.120
Core competencies	3.7293	3.625	2.917
Knowledge resources	5.4167	5.120	5.604
Lifelong learning	3.6977	3.720	3.958
Strategic finance	4.3953	4.625	3.591
Markets	4.9699	4.840	4.761
Competition	4.6917	5.040	4.227

^aStatistical significance was found for planning window, vision, and mission responses based on a chi-square test, indicating that statistical difference exists between responses given for each group.

Vision, Mission, and Objectives

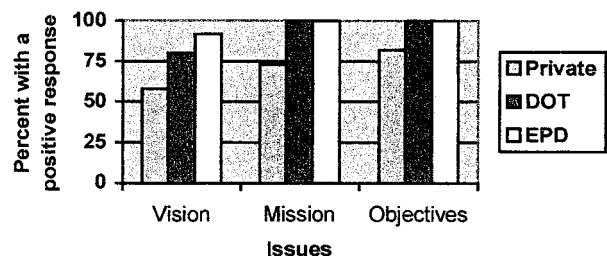


FIG. 2. Percentage of Organizations Having Vision, Mission, and Objectives Statements from Each of the Survey Groups

lishes the ultimate goal for the organization to achieve. As indicated in Fig. 2, the public agencies have a far greater focus on establishing vision statements with 87% of the DOTs and 92% of the EPDs having vision statements compared to only 58% of the private organizations.

Complementing the results generated from the vision question are the results generated from the mission question. 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 2, the response to this question once again produced a significant difference between the public and private organizations. Similar to the vision statement, the public agencies demonstrated greater long-term focus with each having 100% response rates compared to 73% for the private organizations. Finally, the objectives question 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. Although the public agencies continued to lead private organizations with the DOTs and EPDs having 92% and 88% rates, respectively, private organizations did not lag far behind with an 82% positive response rate.

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 the core competencies question (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. The overall average for the question was similar between the private sector and the DOTs with an average of 3.7 and 3.6, respectively. These responses indicate that a plan to focus the organization on core competencies is either in the conceptual stage of development or has been developed, but not as yet moved to the implementation stage. The EPD agencies were slightly behind this average with a response average of 2.9. An interesting note in the response rate for this question is the dispersion in the answers as indicated by the standard deviation for both the private organizations and the DOTs (Figs. 3–5). With a standard deviation approaching 2.0 and reflecting the variability in responses received for this question, it was just as likely for an organization to respond with a 2 or a 6.

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, the knowledge resources question (question M) queried the respondents on their focus on the future. Specifically, the knowledge resources question emphasized the use of the Internet as a tool to facilitate organization employees working to-

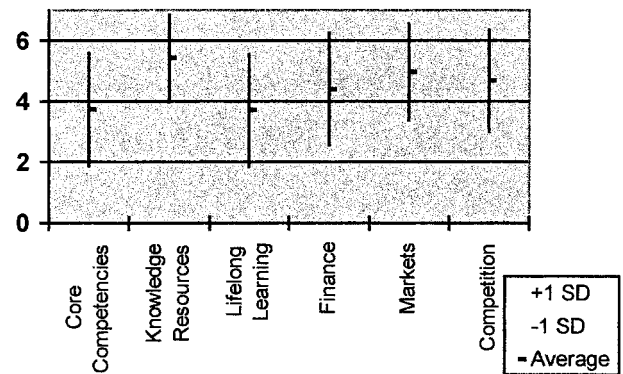


FIG. 3. Averages and Standard Deviation Values for the Strategic Management Issues as Answered by the Private Construction Organizations

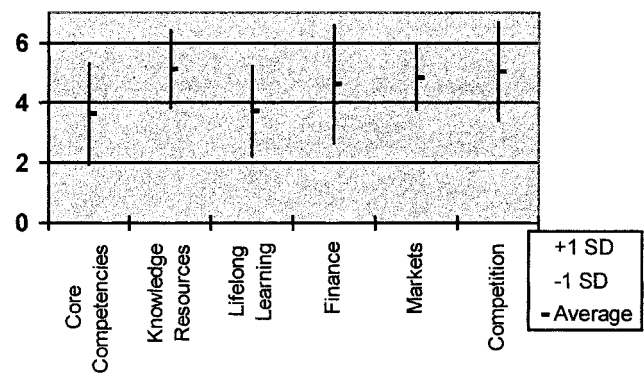


FIG. 4. Averages and Standard Deviation Values for the Strategic Management Issues as Answered by the DOT Organizations

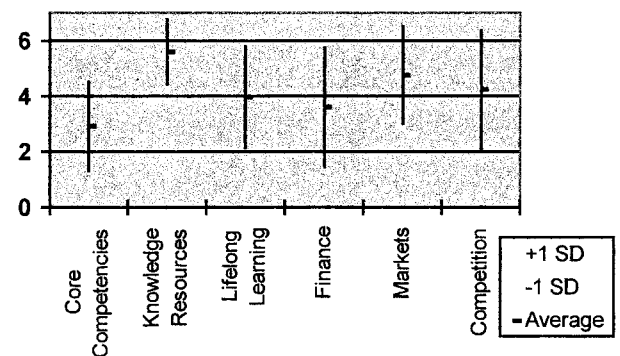


FIG. 5. Averages and Standard Deviation Values for the Strategic Management Issues as Answered by the EPD Organizations

gether through the exchange of knowledge. As indicated in Figs. 3–5, the response to this question was a stark contrast to the core competencies question. Whereas the average for core competencies was the lowest in the survey, the average for the knowledge resources question was the highest in the survey with averages exceeding 5.0. The dispersion in the responses was similarly low at 1.4 or less. This average and dispersion indicates that the use of the Internet is entering into the strategic management concerns of both public and private organizations. With 83% of the organizations currently focusing on the implemen-

tation of a strategic technology plans, this is one of the strongest areas found in the current study.

The final focus on internal strategic issues was reflected by the lifelong learning question (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, the lifelong learning question revealed a strong aversion to expending organization resources on lifelong learning. As indicated in Table 2 and Figs. 3–5, the average response to this question ranged from 3.7 to 4.0. Of particular note in this question is the contrast to the previous technology question. Whereas the significant majority of organizations were actively implementing technology plans, 64% of the organizations are predominantly in the conceptual stage of development for lifelong learning.

External Issues

The final category of interest in the strategic management survey was the focus on external issues. 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 and regulatory environment.

The first external issue of concern was the response by organizations to the economic swings that occur in the architecture/engineering/construction (A/E/C) industry. The strategic finance question (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 2, the average response to this question ranged from a 3.6 to a 4.6. The type of organization did not prove to be a deciding factor in this response. However, it should be pointed out that the dispersion was higher in the public agencies than the private sector (Figs. 3–5). This larger dispersion reflects a range of answers that result from some state agencies adopting the position that agency budgets reflect the focus of the state government and thus, are outside the direct control of the agencies. From this perspective, public agencies provided a variety of responses with a segment of the organizations actively implementing plans and others choosing to follow the variances inherent in the government appropriation process.

The second issue of concern for organizations from external forces is the impact of new market opportunities on existing business or agency practices. The central empha-

sis in this area is the identification of new customer opportunities as a basis for expanding current service products. This emphasis is important for organizations that are attempting to develop strategic plans that consider the expansion of services as a key component in increasing customers and reducing the pressure from potential competitors for increased revenue or budget allocations. The new markets question (question P) addressed this issue by asking respondents to indicate their organization's status in proactively identifying new and expanded market or customer opportunities. Similar to the focus on technology, respondents are making considerable progress in this area of strategic management. All groups in this category averaged almost a 5.0, indicating that this topic is receiving implementation-level attention with 14% of organizations developing evaluation measures for their customer analysis 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 for private organizations 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. Similarly although not as explicitly, public agencies face increasing competition for budget allocations as shifting state priorities create potential threats to existing program appropriations. In response to this issue, the competitive advantage question (question Q) asked respondents to indicate organization efforts to position against new competitors or threats to budget appropriations. As indicated in Table 2, the response to this question demonstrated similar, but slightly lower implementation stage averages for two of the three groups, than that identified for the new markets question, with an average response ranging from 4.3 to 5.0.

ANALYSIS

The results of the strategic management survey provide a basis for analysis in the following areas: (1) strategic areas that organizations focused on the built environment are addressing in a positive manner; (2) strategic areas that these organizations need to address with greater emphasis; and (3) the impact of organization type on strategic management practices.

Positive Strategic Management Areas

The strategic management survey provides positive indications in two areas, technology and market awareness. In technology, both the private and public organizations indicate that the integration of technology to support knowledge transfer between members is an area that is receiving significant attention. With 83% of all respon-

dents indicating that technology integration is either in the implementation or measurement stage, technology integration moves to the forefront of strategic issue awareness. As discussed at the beginning of this paper, the new wave of information technology capabilities is transforming the manner in which built environment 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 67% of the respondents indicating that market and customer opportunity identification being in an implementation or measurement stage, this question reflects the strong competition that exists to provide unique customer services in both the public and private aspects of the construction industry. As indicated by the lack of statistical significance attributed to organization type, 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 or customer services that organizations were investigating. Rather, the analysis can state that organizations involved in developing the built environment are aware of the need to strategically position themselves in new markets to respond to changing customer demands, 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 core competencies, 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 a 64% of the respondents indicating that lifelong learning has not progressed past the development phase, lifelong learning received the second lowest focus of the strategic management issues. In contrast to the author's assumptions prior to the study, the type of organization does not factor into this response. Although private organizations indicate an institutional focus on craft and entry-level training, the attention to lifelong learning received far less emphasis. Similarly, public agencies placed a significant emphasis on regulatory courses for staff personnel, but were less focused on education for senior personnel.

The second area that the survey results indicate a need for greater emphasis is that of core competencies. With the lowest average among the survey respondents, the core competency focus is receiving significantly less attention than the remaining six areas. The significance of this statistic arises from the fact that organizations must build on a stable foundation if they are to succeed over a long-term planning period. An organization's core competencies form this foundation (Pralhad and Hamel 1990). Without a focus on these competencies, the organization places itself at risk of entering initiatives that either dilute or abandon the organization strength. Once such a scenario occurs, the negative impact can multiply as organizations attempt to shore up weaknesses in the newly entered area, thus further diluting the core competency. Unfortunately, with many organizations reporting only an awareness of the core competency concept, significant education is required before many organizations will have the tools to refocus on this topic.

Impact of Organization Type

Any research in the construction industry cannot ignore the fact that the industry is comprised of 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 (U.S. Bureau of the Census 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 inclusion of public agencies from 50 different states introduces local, regional, and national forces that affect each state in different areas. Given these factors, the research team believed prior to this survey being conducted that these differences would be reflected statistically in the responses given by each respondent category.

As detailed in the data sections, these statistical differences did not appear. Rather, except for the long-term planning focus related to planning periods, a vision statement, and a mission statement, no other question was found to have the type of the organization as a statistically significant variable. The same strengths and weaknesses were found in every group. Uniform strength was found in technology and markets, while uniform areas for improvement were found in education and core competencies. Similarly, the dispersion in the responses was relatively uniform across the survey. In areas such as core competencies and financial risk analysis, dispersion was high in each group, while 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 strategic management practices, other than the planning window, are statistically similar in both the public and private organi-

zations that focus on the construction of the built environment.

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 economy 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.

Addressing strategic management gaps will require an organization to invest time, planning, and monetary resources. Given this commitment, an organization must determine where the resources will be allocated. However, this process must not be an either-or situation. Rather, balanced advancement in each area is a required 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 lifelong learning concerns), while at the same time investing in a team to analyze the current competitive situation in an identified customer service area (a larger resource commitment, but one that is considered critical to long-term success by the organization).

The strategic management survey illustrated that construction-related organizations have strengths in isolated 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 processes that will temper its dependence on an uneven economic future.

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