CCIS

EMERGING TRENDS IN OWNER/CONTRACTOR ORGANIZATIONAL CHANGES FROM THE CONTRACTOR'S PERSPECTIVE

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CENTER FOR CONSTRUCTION INDUSTRY STUDIES

REPORT NO. 11

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A Report of the

Center for Construction Industry Studies

The University of Texas at Austin

Under the Guidance of the

Owner/Contractor Organizational Changes Thrust Team

Austin, Texas

October 2000

Executive Summary

This document represents a progress report by the Owner/Contractor Organizational Changes Study research team on Emerging Trends in Owner/Contractor Organizational Changes from the Contractor's Perspective for the Center for Construction Industry Studies funded by the Alfred P. Sloan Foundation. This research has three primary purposes. The first purpose of this report is to understand how changes in the nature of the owner/contractor relationship for capital facility projects have impacted the contractor community. The second purpose of this report is to understand how these changes affect the outcomes of capital projects. The third purpose of this report is to understand how these changes affect the human resource practices of contractor firms.

During this study, the study team accomplished the following five major tasks. First, The University of Texas at Austin study team developed preliminary research goals and a research methodology for the contractor phase of the Owner/Contractor Organizational Changes Study. Second, the research team conducted a review of engineering and business literature relating to changes in the owner's marketplace, changes in the construction industry and the implementation of collaborative relationships in the construction industry from the contractor's perspective. Third, the study team developed a survey instrument to collect data around the Research Goals for the contractor phase of the Owner/Contractor Organizational Changes Study. Fourth, the research team conducted in-depth telephone surveys with 13 individuals representing 10 contractor firms to validate the survey instrument. Fifth, the study team evaluated the study findings and developed the path forward for the next phase of the research.

This document outlines the findings from these tasks. Chapter 1 provides some background information, summarizes the results of the literature review and discusses the research goals and methodology in detail. Chapter 2 examines the key findings of this study. Chapter 3 outlines the proposed path forward based on these findings**.**

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Chapter 1
Background and Literature Review

1.1 Background

The Center for Construction Industry Studies (CCIS) is a multidisciplinary research program funded by a grant from the Alfred P. Sloan Foundation. Researchers from The University of Texas at Austin College of Engineering, The University of Texas at Austin Graduate School of Business and Texas A&M College of Engineering staff the CCIS Owner/Contractor Organizational Changes Study Team. The CCIS study team is currently conducting research on the changing nature of owner/contractor relationships for capital facility projects, how these changes affect the outcomes of capital projects and the impact of these changes on the human resources practices of owner and contractor/supplier firms. This research is being conducted as two separate, parallel initiatives. One initiative focuses on the changing nature of the owner/contractor relationship from the owner perspective, and the second initiative focuses on this topic from the contractor perspective. Since both of these initiatives are discussed in this report, some term clarification is in order. Henceforth, the study focusing on the changing nature of the owner/contractor relationship *from the owner perspective* will be referred to as the Owner Organizational Changes Study or the owner study. The study focusing on the changing nature of the owner/contractor relationship *from the contractor perspective* will be referred to as the Contractor Organizational Changes Study or the contractor study.

The Owner Organizational Changes Study was the first initiative launched by the CCIS. To date, the owner study team has completed and published the results of two study phases. The findings of the Owner Phase I Study were published in March 1998. The Owner Phase II Study findings were published in April 1999. The Owner Organizational Changes Study is currently collecting data for Phase III of this research.

The Contractor Organizational Changes Study was initiated in November 1998. Phase I of this study is the subject of this progress report. During Phase I of the contractor study, the study team accomplished the following:

- Assembled the study team;
- Developed initial objectives;

- Completed a literature review;
- Conducted 13 interviews with members of 10 companies to identify gaps in the research questions and to further refine the research questions;
- Validated a survey instrument;
- Developed a detailed methodology for the next phase of the Contractor research;
- Insured between sample alignment in the overall Owner/Contractor research initiative.

1.1.1 Contractor Study Initial Objectives

The initial objectives of Phase I of the Contractor Study were to:

1. Understand the current nature of owner/contractor relationships for capital projects *from the contractor's perspective*:
   - what forms do these relationships take?
   - why were the relationships formed?
   - what benefits accrue to the contractor, if any, from these relationships?
   - how these relationships are coordinated, monitored and measured by the owner and the contractor?
   - what are the success indicators for these relationships?
   - what formal methods of organization learning exist within the contractor organization that allows for the identification, documentation and maintenance of the owner organization's specific experience?
   - what future issues and challenges surround the owner/contractor relationship?
2. Understand how the use of contractors by owners has changed over the past five years:
   - what has caused these changes?
   - how has the owner supervision of and relationship with contractors changed during this period?
   - how have contractors adapted to these changes?
   - how have these changes affected the quality of or the process used for capital facility construction?

3. Understand how the Human Resources requirements in the owner and contractor organizations have been impacted:

    - what are the most important competencies for *contractor* firm employees and how have these changed over the past five years?

    - what are the most important competencies, from the contractor's perspective, for *owner* firm employees and have these changed over the past five years?

    - what are the future issues surrounding the staffing by contractor organizations of capital facility projects?

4. Determine if these organizational and Human Resource changes have impacted the quality of capital facility projects:

    - does the existence of an owner/contractor relationship affect the timing of contractor participation in the project process?

    - does the existence of an owner/contractor relationship affect project quality?

1.1.2 The Study Team

A multi-disciplinary study team from The University of Texas at Austin College of Engineering and The University of Texas at Austin Graduate School of Business is coordinating and monitoring the overall CCIS research on Owner/Contractor Organizational Changes. The study team is conducting the research as two separate, parallel initiatives; one initiative focuses on the changing nature of the owner/contractor relationship from the *owner perspective,* and the second initiative focuses on this topic from the *contractor perspective*. Table 1.1 lists the members of the CCIS multi-disciplinary owner/contractor study team, and the respective owner and contractor sub-teams.

Table 1.1: UT Study Team

G. Edward Gibson, Jr.*	Civil Engineering Dept., Associate Professor
Alison Davis-Blake**	Management Dept., Associate Professor
Joe Broschak**	Management Dept., Ph.D. Student
Kevin Dickson**	Management Dept., Ph.D. Student
Donna J. Ryan-Rose*	Civil Engineering Dept. Ph.D. Student
Todd Graham	Civil Engineering Dept. MS Student

*Contractor study team ** Owner study team

1.2 Literature Review

The focus of this research is the changing nature of the owner/contractor relationship in the construction industry *from the contractor's perspective*. Since the construction industry is a reactive industry, the contractor's relationship to the owner is a reactive relationship as well. In addition to reacting to the needs of its customers, the contractor community must also react to industry specific changes. It is a company's ability to operate efficiently and effectively in this changing industry environment that determines its profitability and growth.

To reflect the complexity of this market-industry interface, the literature search has been divided into two sections. The first section relates to the Owner's business environment and focuses on market changes and their effect on owner organizations, each sub-section addressing a piece of the complex framework that is the business environment within which the users of architectural/ engineering/ construction services operate. The following topics are discussed in greater detail in the first section:

- Core Competency and Strategic Outsourcing Strategies
- Business Relationships and Networks
- Organizational Learning
- Owner Organizational Changes

The information provided in the above four sub-sections should assist in explaining the external environmental stimuli, which act, indirectly on the contractors through their clients.

The second section relates to the Contractor's industry and focuses on the industry-specific changes to which contractors must manage and adapt if they are to stay competitive within the construction industry. Two topics are discussed in greater detail in the second section:

- Construction Industry Trends
- Partnering and Other Business Relationships

This second section should assist in establishing the industry stimuli that the contractor community must manage to maintain a profitable, competitive position within the industry.

1.2.1 Owner's Business Environment

This section discusses the three major forces at work in reshaping the structure and function of the owners' business environment: the core competency and strategic outsourcing strategy, business and network relationships, and organizational learning. It also explores the impact of these initiatives on the owners' general business environment and how these changes have impacted *owner organizations* as they interface with the construction industry in the outsourcing of design and engineering services.

1.2.1.1 Core Competency and Strategic Outsourcing Strategies

This strategy manifested itself in three concepts that were to become the defining lexicon of the business environment of the 1990's; core competencies, corporate downsizing and strategic outsourcing.

The "core competency" strategy (Quinn and Hilmer, 1994), also known as the dis-aggregation of organizations, is described as follows:

> *By partnering its own particular competencies with equally competent contract suppliers of component parts and constituent services, a vertically-integrated industrial era enterprise can transform itself into a virtually integrated information era enterprise: a collaboration of competent independent components. This on-going "dis-aggregation" of industrial era institutions has become the most palpable manifestation of the drive toward competence-based enterprises* (Edwards and Snyder, 1999).

Downsizing, defined as "intended reduction of personnel," has rapidly swept across the landscape of corporate America (McKinley et al. 1997). Between 1987 and 1991, more than eighty-five percent of the *Fortune 100* corporations downsized their staff (McKinley et al., 1997). In their summary report, the Federal Facilities Council (FCC, 1998) noted the following significant effects of downsizing on owner organizations:

- Downsizing was not a well-planned process; mistakes were made necessitating further changes to rectify them.
- Technical competency was lost to assist businesses in defining the most appropriate projects to meet the businesses' needs.

- As their experienced and skilled personnel retired, organizations were slowly losing their abilities to define alternatives effectively.

- Where downsizing was accompanied by decentralization, the strong connection to the organization mission and vision was lost. Business units began developing their own mission and vision and losing their central focus.

- Business units developed a parochial mentality as their success was measured on their own results as profit centers. This discouraged the support of other corporate objectives or other business units.

- There was the loss of the layer that converted strategy to operations and operations into a corporate direction.

- Communication took place between business people and contractors, because the former middlemen--the engineering staff- were no longer there to bridge the gap.

- When downsizing was implemented as a cost reduction strategy, evidence shows that downsizing did not reduce expenses as much as desired and that sometimes expenses might actually rise (McKinley et al., 1997).

Downsizing only becomes an operational strategy when coupled with a means of replacing the functional capacity lost through eliminating human capital. To replace this lost functional capacity, most organizations turned to a combination of technology and outsourcing.

Outsourcing occurs when a company decides that an operation can be done more efficiently, effectively, and at a lower total cost by an outside entity. Outsourcing can also be employed as a means of supplementing in-house resources or replacing them. The latter occurs when outsourcing is used to implement a downsizing strategy. An organization evaluates its core competencies, selects the functions that will continue to be handled in-house, and restructures them accordingly. It also identifies the activities for which it has neither the critical strategic need nor the special capabilities. These activities are then transferred, or "outsourced" to external suppliers, corresponding internal assets are eliminated, and the organizational structure consolidated or "downsized."

Among the functions most commonly outsourced by owner organizations are accounting, warehouse operations, purchasing, maintenance, auditing, fleet management, information technology, mailroom, credit and engineering services (Underhill, 1996). The

outsourcing of detailed engineering design for facility projects by owner organizations began the process of downsizing owner in-house engineering staff. The outsourcing of design, engineering, and construction services by owner organizations, coupled with the downsizing of their in-house engineering staffs, has caused a major change in the owner organizational structure. It was in response to the impact of downsizing and outsourcing by owner organizations, that contractors were forced to undergo an organizational metamorphosis as well.

As a consequence of owners downsizing and outsourcing services, they have changed the configuration of their procurement portfolio. Owners have replaced a few contractors supplying a limited range of goods and services with a network of contractors supplying everything from accounting to engineering services. This migration to networks of business relationships and the challenges associated with managing these networks are the topic of the next section.

1.2.1.2 Business Relationships and Networks

As owner organizations implement the core competency strategy by downsizing and outsourcing non-critical functions, they are rapidly replacing traditional markets with networks of business relationships. The purchasing focus is "dramatically" shifting from a transaction to a relational oriented approach. In their recent paper on this topic, Araujo et al. (1999) summarize the effects of this shift from a transaction to relational business relationships by pointing out that the emphasis in business relationships has moved from price to the benefits that can be attained from collaborative relationships. They feel that the source of future competitive advantage will be the "type of relationship" that firms have with their suppliers. The control of resources, as well as access to resources controlled by other parties, will define a firm's competitive advantage.

This transition from transactional to relational business portfolios can be traced back to the emergence of global competition, enhanced by the removal of regulative barriers. Customers are demanding shorter and more flexible delivery times at very competitive prices and are pressuring firms to increase their operational efficiency. In response, firms are creating streamlined supplier networks, where each member specializes in activities where it

has a strong core competence (Moller and Halinen, 1999). The structure becomes one of a core organization focusing on its core competency, supported by a network of suppliers, each of which supplies the core organization with goods or services that are core competencies for the supplier organization. Maximizing singular sales transactions is no longer the main challenge for management, but rather achieving customer satisfaction, customer retention and long-term commitment are the primary goals. In making the transition from a vertically integrated, self supporting organization with a few dyadic (pair) supplier relationships to a horizontally ordered system with a network of business relationships, the structure and management of the business network portfolio becomes a new and critical skill for the core organization.

Just as this change in corporate strategy altered the structure of the organization, it also impacted the knowledge creation process, the process by which individuals and organizations acquire and maintain knowledge and skills. Since organizational knowledge determines how effectively an organization can maintain its competitive advantage, changes in the knowledge creation process, or organizational learning, dramatically affect an organization's ability to successfully implement and function within the core competency strategy. The next section discusses these transitions in organizational learning.

1.2.1.3 Organizational Learning

The globalization of competition, tremendous improvements in global transportation, and the ever accelerating rate of technological advancement have made most materials, tools and processes available to all of the competitors within a given industry (Hakansson, Havila and Pedersen, 1999). Cutting edge technology has now become a short-term competitive advantage for organizations looking for long-term competitiveness and survival (Levy, 1996). Stata argues in his 1989 article that, "the rate at which individuals and organizations learn may become the only sustainable competitive advantage, especially in knowledge-intensive industries."

The concept of organizational learning is difficult to define. In his article on this topic Stata contends,

> *We tend to think of learning as a process by which individuals gain new knowledge and thereby modify their behaviors and actions. Similarly, organizational learning entails new insights and modified behavior. It differs from individual learning in several respects. First, organizational learning occurs through shared insights, knowledge and mental models. Thus organizations can only learn as fast as the slowest link. Change is blocked unless all of the decision makers learn together…. Second, learning builds on past knowledge and experience -that is, on memory. Organizational memory depends on institutional mechanisms used to retain knowledge.* (Stata, 1989)

As organizations transition from vertically integrated systems to a horizontally ordered network of systems through the implementation of the core competency and strategic outsourcing strategies, they must also change the way they organizationally learn. In his article, Holmqvist maintains that the traditional approach has emphasized learning within integrated and coherently bounded entities, struggling to adapt to an independent, hostile environment. The process of creating knowledge in a "traditional" organization focuses exclusively on the transfer of knowledge between two well-defined repositories.

As an organization externalizes non-core functions, it becomes the core organization at the center of a network of multiple relationships. In the horizontally ordered system, organizations no longer have integrated and coherent boundaries. Processes and personnel begin to migrate outside the limits of the conventional organizational structure. The boundaries of the core organization begin to blur, and it begins to evolve into an "imaginary organization." In describing the attributes of an imaginary organization, Holmqvist writes,

> *The imaginary organization is constantly changing at its border interface. In an imaginary organization, people of different individual and organizational backgrounds are working together to achieve a joint value. They have not been employed according to the same recruiting criteria, the organization differs with respect to the career cultures, they are physically distant, primarily relying on other media than oral communications, they may have different management styles…many actors normally regarded as "external" to the organization, are fundamental*

participants for learning and value-making in the context of the imaginary organization. (Holmqvist, 1999)

The crucial need for mutual interorganizational knowledge to support coordination modifies the knowledge creation process by adding a third repository of knowledge to the traditional model: interorganizational knowledge represented by joint rules and joint routines. Interorganizational knowledge memory is fundamental to "imaginary" organizations' performance, since memory is the buffer against the turbulence due to partner or individual turnover. The addition of a third repository of knowledge increases the number of interfaces and the complexity of the knowledge creation process.

This section completes the discussion of the three major forces at work in reshaping the structure and function of the owners' business environment: the core competency and strategic outsourcing strategy, business and network relationships, and organizational learning. The focus of this section has been the impact of these initiatives on the owners' general business environment. The next section provides insight into how these changes in the owners' general business environment have impacted *owner organizations* as they interface with the construction industry in the outsourcing of design and engineering services.

1.2.1.4 Owner Organizational Change Study

The CCIS Owner Phase I Study was a study conducted over a 10-month period that allowed the study team to identify several critical findings that provided the basis for the next phase (Gibson et al. 1998). During Phase I of its work, the study team conducted one corporate site visit and 11 interviews with seven companies. The results of the Owner Phase I Study were published in March 1998 and formed the basis for the Phase II study.

The Owner Phase II Study findings were published in April 1999 (Davis-Blake et al., 1999). During Phase II of its work, the owner study team conducted in-depth telephone interviews and site visits at two owner firms. In total, the Owner Phase II study team conducted 42 interviews with 37 individuals. In some cases, the team visited multiple geographic locations for a single owner. Their research focused on the changing nature of the Owner/Contractor relationship for capital facility projects *from the owner perspective*.

The following is a brief summary of the findings from Phase II of the owner organizational changes study:

- The owner-contractor relationship appears to have many purposes, not all of which are fully recognized by owners.

- Goal conflict is a critical, but often-unrecognized feature of the owner-contractor relationship. Many owner personnel saw this lack of goal congruence as a symptom of difficulty either with the contractor or with the owner-contractor relationship. In fact, goal conflict may be a natural outgrowth of the fact that owners and contractors have different business objectives. The owner-contractor relationship needs to be structured so that each party can meet their separate goals.

- Another defining feature of the owner-contractor relationship is the level of owner involvement in projects. At one extreme, the owner determines only the economic viability and key design features of the project. At the other extreme, owner personnel maintain active involvement with the contractor throughout the entire project.

- Another defining feature of the owner/contractor relationship is the way in which the contractor's involvement with the owner is structured. Models of contractor involvement could be arrayed along a continuum. At one extreme, the owner and the contractor have a formal, written highly specified alliance that is agreed upon and managed at fairly high levels in both firms. The other extreme model of contractor involvement consists of the owner getting bids for the design or construction of each facility and giving the contract to the low bidder (other factors being equal).

- Communication difficulties between owner and contractor are the most commonly cited problem in the owner/contractor relationship. While owners and contractors use a wide variety of formal and informal coordinating mechanisms, it appears that existing coordination mechanisms are not sufficient to meet communication needs.

- The study team encountered many examples of attempts to increase knowledge sharing and learning between owner and contractor personnel. However, like coordination and monitoring, the area of learning is one where owner firms' work structures have not kept pace with the demands of new kinds of owner/contractor relationships. Although owners desire to learn from contractors and cite increased learning as an important benefit of alliance and preferred provider relationships, owner firms still do not have systematic structures for assessing and documenting their learning from contractors.

- Monitoring and evaluating contractor performance is another area where work structures have not kept pace with the changing nature of the owner/contractor relationship. Although owners have at least some metrics for project performance,

we found few instances where owners had clear metrics that could be used to assess the performance of *relationships*. Developing methods for assessing relationship success appears to be an important future challenge for owners.

- The respondents identified many specific attributes of successful owner-contractor relationships. These attributes can be grouped into seven basic categories and are listed in Table 1.2.

Table 1.2: Attributes of a Successful Owner-Contractor Relationship: The Owner Perspective Source: (Davis-Blake et al., 1999)

Attribute	**Definition**
Contractor meets owner's Project objectives	The project is delivered on or ahead of schedule and budget targets with minimal rework in the field. Startup is smooth.
Contractor understands owner's business	Contractor personnel understand owner's business objectives and operating systems and procedures
Integration of owner and contractor personnel	Owner and contractor work together repeatedly, using many of the same personnel from project to project. Owner and contractor develop effective communication structures, a shared vocabulary, and a common project culture. Owner and contractor systems are integrated to the extent possible. Trust develops between owner and contractor personnel. Multiple levels of personnel are involved in both the owner and contractor organization
Contractor responsiveness to changing conditions	Contractor responds quickly and effectively to owner needs. Contractor informs owner as early as possible about upcoming difficulties
Contractor willingness to innovate	Contractor is willing to challenge owner ideas, recommend improvements, and take risks.
Operating for mutual benefit	The relationship benefits both owner and contractor. Gains made through a productive relationship, such as cost savings, are shared between owner and contractor.
Learning from the relationship is documented and used	Owner and contractor explicitly discuss and document the lessons learned from each project. If possible, these lessons are integrated into systems and procedures that can be reused on subsequent projects.

- It is clear that individuals use the term "alliance" to mean many different things. It is impossible to answer the question of whether alliances are beneficial without specifying in more detail the specific structure of the alliance and the behaviors that underlie the alliance. One thing is clear: simply calling a relationship an alliance does not increase the probability of relationship success.

- Although individuals discussed the idea that alliances can create common interests between owners and contractors and improve information flow, there were no methods of documenting whether these benefits actually occurred. It is important to note that a successful relationship and successful projects are two different things. A successful relationship overall may still have projects with a variety of outcomes.
- To work effectively with contractors, owner personnel require a number of traits that are not easily developed after hiring. When owner personnel operated in a carefully controlled environment where their behavior was shaped by starting "at the bottom" with very little responsibility and taking on gradually increasing amount of responsibility over the years, selection based on these traits would be less important. However, given that owner personnel may now have few peers to shape their behavior and operate autonomously from an early stage in their careers, selection based on these traits may be more essential.

Table 1.3 lists the traits to be considered during the selection of owner project professionals.

Table 1.3: Traits to Consider during Selection of Owner Personnel.
Source: (Davis-Blake et al., 1999)

Trait	Definition
Agreeableness	Ability to get along with others and be open minded to new ideas.
Assertiveness	Willing to take risks and aggressively pursue a goal to its completion.
Confidence	Trust in one's own ability to perform the required tasks and in the abilities of others to fulfill their responsibilities.
Conscientiousness	Perseverance, responsibility, and thoroughness in completing task.
Judgment	Ability to differentiate between trivial and important details. Awareness of abilities and limitations of people and ideas.
Trustworthiness	Personal integrity and honesty. Ability to inspire others to have trust in one's self.

- Owner personnel are unanimous in their view that changing owner/contractor relationships require owner personnel to have new skills. It is fairly widely recognized in owner firms that the skill set required to manage and work on projects from the owner's side has changed dramatically (e.g., more "soft" skills are important; deep technical knowledge is less important). It is widely recognized that, in order to work effectively in an environment where contractors are used extensively, owner personnel must possess a variety of skills. These skills can be grouped into six categories and are listed in the Table 1.4.

- Although the skill sets required of owner personnel has changed radically, owner firms have invested relatively little systematic effort into methods for ensuring that their personnel have the required skill sets. The issue of skill development of owner personnel is perhaps the most important difficulty facing owner firms.

- The full impact of this lack of training has not affected owner firms. Owner firms currently rely on the few experienced personnel that they have retained in-house.

The tenure distribution is heavily skewed toward individuals with more than 15 years of experience and reflects very limited hiring during the past five years. As the current cadre of long-tenured individuals retire and need to be replaced, the effects of lack of training will become more critical.

- At most owner firms, hiring of new engineers has been relatively limited. Thus, owner firms have had little chance to experiment with developing new career paths to train the next generation of project managers. It is unclear what career path and which experience leads to the project manager role, which makes future staffing of this role quite difficult. Similarly, there does not appear to be a career path out of the role, which may lead to problems with both burnout and retention.

Table 1.4: Skills Required by Successful Owner Project Personnel
Source: (Davis-Blake et al., 1999)

Category of Skills	Examples of Skills
Business Skills	Writing and managing contracts Negotiation Managing budgets and schedules
Communication Skills	Coordination/liaison Conflict management Cultivate broad network of relationships
Influence Skills	Mentoring Motivating Change management
Managerial Skills	Team building Delegating Politically aware/see big picture
Problem Solving Skills	Continually analyze options/innovation Planning Consider both sides of issues, risk management
Technical Skills	Understand entire construction process Multi-disciplined (knowledge of several areas of engineering) Information technology skills

In summary, the Owners Phase II Study found that owner project professionals face the daunting task of continuing to service capital programs with a shrinking work force. Alliances are used to "fill the gap," but are not being systematically developed or measured. Revitalization of work force on the owner side is a pressing issue with few concrete solutions. New skills and worker traits are needed to manage the more complex relationships that have evolved. Contractors face many of the same issues and although opportunities for more work are available, the risk of doing business is increasing in many cases as well.

From the Owners Phase II Study, the team's overall conclusion is *that the relationship structure between owners and contractors has changed significantly over the past several years, while the corresponding work processes and resources needed to manage these changes have been slow to catch up.*

1.2.2 Contractor's Industry

The previous section discussed the three major forces at work in reshaping the structure and function of the owners' business environment: the core competency and strategic outsourcing strategy, business and network relationships, and organizational learning. It also explored the impact of these initiatives on the owners' general business environment and how these changes have impacted *owner organizations* as they interface with the construction industry in the outsourcing of design and engineering services.

This section focuses on the industry-specific changes to which contractors must manage and adapt if they are to stay competitive within the construction industry. This section also discusses the use of collaborative relationships by the construction industry as an adaptive behavior mechanism in managing change.

1.2.2.1 Construction Industry Trends

To mark its 125th anniversary, Engineering News Record convened a panel of industry experts to explore the changes and issues ahead for the construction industry. The panel participants focused on past, present and future industry trends in five main areas: work force, project delivery, companies, economics, and technology (ENR, 1999).

The recruitment of new employees and the retention of existing employees across all segments of the industry were cited as one of the major threats to the continued growth and development of the construction industry. Despite efforts to increase the level of industry automation, the construction industry still relies very heavily on its human capital. Among the reasons cited for the inability to attract and retain personnel were:

- The construction industry is now competing with many other industries for the "knowledge worker." In the race to recruit the best and brightest candidates from a diminishing supply of technical graduates, the construction industry cannot compete with the high-tech industries in terms of salary, benefits, career path, and career status.

- The industry has been slow to encourage diversity within its ranks, especially among nontraditional groups like minorities and women.
- The industry has done little to educate and inform potential future employees about the industry and continues to view the professional growth and development of current employees as an individual responsibility.
- The industry's ability to develop a supply of talented educated people and to retain their current talent are considered factors in determining whether the construction industry continues to grow.

Most of the discussion regarding changes in the project delivery system really served as a platform from which to explore changes in the owner organizational structure, particularly owner outsourcing and downsizing. The comments show an industry struggling to understand this trend, perplexed by the extent of its impact on the construction industry and trying to ascertain an appropriate response. Norbert Young, president of the Construction Information Group of McGraw-Hill Cos. summed the industry confusion up best, "I think the industry should stop worrying about different project deliveries and putting things in boxes and figure out what the client is really after and how you deliver that (ENR, 1999)."

This confusion regarding the client base is only compounded by uncertainty within the construction industry. The industry is under increasing economic pressure. The commodity pricing of services has held down profit margins. The entrance of new competitors has threatened market share. Increasing costs due to a shrinking labor supply and the need to be a player in the global market have increased operating costs. Opinions are mixed on whether the industry will remain fragmented, with a Darwinian approach to survival, or it will respond with a megaroll-up (ENR, 1999).

Owner firms are expanding the types of services that they are looking to contractors to supply. "Project financing is fast becoming as important a factor in winning jobs as low price and high technology. Knowing how to bring money to the table is critical for many firms and communicating numbers with owners a must (ENR, 1999, 53)." This is requiring contractor firms to broaden their areas of expertise beyond those associated with traditional construction means and methods.

In construction, technology is transforming the industry. It is causing changes in workforce management through 24-hour engineering, worksharing, and improved access to

information and communication. It is creating cost savings by increasing productivity, shrinking the globe and reducing the impact of time and distance. It is improving a firm's competitive advantage by insuring that critical information is updated and widely available. Yet amidst this unprecedented progress, the panelists sounded a word of caution. In an industry notoriously resistant to change, there is concern about the widening management gap and barriers to progress caused by technology-challenged boardrooms. The ability of the industry to manage the changing skill base required of the new technocrats and provide the training to update the skills of their existing employees is of concern.

1.2.2.2 Partnering and Other Business Relationships

> *Until a few years ago, the large, integrated organization was the undisputed king of the business jungle. Now, its crown is being contested by more sociable corporate creatures, hunting in packs. The intensity of the competition is not abating -–quite the contrary – but the primary competition agent is changing. Co-operation is ceasing to be the opposite of competition, and is becoming instead one of its preferred methods*. (Deering and Murphy, 1998)

The ability to create value through the development and management of portfolios of business relationships is becoming fundamental to an organization's ability to compete effectively in the global market. In the major financial newspapers, the *Wall Street Journal, The Financial Times* and *Reuters News-Far East,* mentions of partnerships, joint ventures and strategic alliances quadrupled between 1987 and 1995 (Deering and Murphy, 1998).

In response to increased global competition, eroding profit margins, the fragmentation of the design and construction industry, changing client organizations and increased reliance on formal litigation to resolve disputes, a partnering movement emerged in the construction industry (Larson, 1995). Partnering is based on the realization that the traditional adversarial relationships between owners and contractor are ill equipped to survive major disputes. As litigation became the industry's solution to dispute resolution, it became increasingly apparent that there were no winners, except perhaps the attorneys. Abraham Lincoln offered the following advice to attorneys, widely quoted in the legal community today, "Discourage litigation. Persuade your neighbors to compromise whenever you can. Point out to them how the nominal winner is often a real loser in fees, expenses and waste of time."

According to the Construction Industry Institute (CII) (In Search of Partnering Excellence, 1991), partnering is "a long term commitment between two or more organizations for the purpose of achieving specific business objectives by maximizing the effectiveness of each participants resources." In 1994, CII commissioned the Partnering II Research Team. A key finding of this research was that the term "partnering" had become a generic term for a wide spectrum of collaborative relationships.

The business literature is full of examples of models of the collaborative process within the owner/contractor relationship. They may vary in the number of steps, the titles of the phases, and the verbiage used to characterize each phase. Fundamental to all of these models is that the development of a collaborative relationships between two organizations, much like human relationships, is a process. Underlying the process is a series of steps, each step requiring the participants to make a greater commitment of resources based on a shared vision grounded in mutual trust to create a tangible benefit.

How well do collaborative relationships work? Some of the literature suggests that 50% of the strategic alliances and as many as 80% of the supply chain partnerships fail to add value (Deering and Murphy, 1998). It is not clear from the literature why the "death rate" is so high. A hint may come from the research conducted on collaborative relationships that have succeeded. In a research study conducted by Baker in 1994 and based on the study of more than 700 public projects that were completed using a partnering approach, one of the most commonly cited difficulties was measuring the specific benefits of partnering. This was cited as one of the most frequently occurring problems, both by the organizations that had measurement programs and those without (Baker, 1996).

> *As the research focus shifts from how the collaborative relationship process works to what makes the collaborative relationship process work, there is the dawning realization that this new model of collaboration requires a new set of principles and a different set of skills to make it work. What they have failed to recognize is that each brick dreams of being a castle in its own right, and that the real essence of the new partnering architecture is not the bricks, but the mortar that both separates and unites them. (Deering and Murphy, 1998, 7)*

1.2.3 Literature Review Conclusions

Based on the literature review presented in previous sections, it is apparent that the construction industry and, specifically, the contractor community have been embattled in the marketplace on two fronts. On one front, they are confronted by the changing structure of the market as the form of the customer-contractor link evolves to accommodate the increasing owner outsourcing of services. On a second front, they are challenged by the changing nature of the industry as it embraces market globalization and uses partnering to compete. Successfully negotiating this dynamic market-industry interface is fundamental to the ongoing success and growth of the contractor community. Yet the boundaries of this interface are becoming more dynamic, flexible and complex to keep pace with the ongoing changes in both the owner and contractor components of this business environment.

It is also apparent from the literature review, that there has been scant research done on owner/contractor organizational changes in general, and no research has been done on this subject from the perspective of the construction industry and the contractor community. Documenting the effect of this turbulence in the market-industry interface from the *contractor's perspective* is the initial step in developing an industry specific management philosophy, principals and practices, "to cope with the wider distribution of power and knowledge in this new era of partnership enterprise." (Deering and Murphy, 1998, 20)

1.2.4 This Report

The remainder of this report is sub-divided into two chapters that address the collection and analysis of the field data. Chapter 2 summarizes the Phase I Contractor Study interview methodology and examines the key findings of the Phase I Contractor Study interviews. Chapter 3 outlines the findings and the proposed path forward based on the Phase I Contractor Study findings**.**

Chapter 2
Contractor Interviews

Phase I of the Contractor Organizational Changes Study was a ten-month initiative focusing on identifying the trends in the contractor community developed in response to the changes in the owner organizational structure *from the contractor's perspective*.

2.1 Methodology

This section discusses the methodology used in the data collection and data analysis for this study. It summarizes the findings across fifteen thematic areas by identifying the major trends within each area.

2.1.1 Target Population

The target population for this study consisted of organizations that are providers of architectural, engineering and construction management services to corporations that construct, own and operate commercial or industrial facilities. For the purposes of this study, these contractor organizations must be independent legal entities, separate and distinct from the owner organizations for which they provide services.

Within a contractor organization, the target population consisted of those individuals responsible for developing, coordinating, and maintaining the client-contractor relationship interface or the client-contractor project interface.

2.1.2 Sample Selection

The survey population was selected using the non-probability sampling method of convenience sampling. Participants were selected from among the pool of contractor organizations and individuals within those organizations with whom the researcher had a prior business affiliation. Each participant was initially contacted by the interviewer, either by telephone or e-mail, and invited to participate in the research study. The interviewer provided a brief background on the research study goals and objectives. The participants were given assurances of confidentiality and anonymity if they chose to participate. All participants were assured that they would receive copies of all papers and reports resulting from the research study.

The sample was balanced by type of services provided; i.e., equally divided among providers of architectural design, engineering design and construction management services. Ten firms were selected as representative of the major suppliers of design, engineering, and construction services to owner firms. Individual participants were selected to provide a representative sampling of the organizational positions actively involved in developing and maintaining owner-contractor relationships. Thirteen in-depth interviews were conducted with representatives from ten design and construction management firms. Table 2 lists the sample characteristics by organizational affiliation, firm type, functional title and the firm's average project size. Interviewing was terminated when a balanced sample was constructed and the survey responses ceased to yield any additional insight into the topics being explored.

Table 2.1: Classification of Contractor Survey Participants

Firm	Firm Classification	Job Title	Average Project Size
A	Engineering Design	Vice President	$1,000,000
B	Construction Management	Vice President	$20,000,000
C	Arch./Engineering Design	Department Director	$15,000,000
D	Engineering Design	Director of Projects	$25,000,000
E	Arch./Engineering Design	Project Designer	$10,000,00
F	Construction Management	Project Manager	$4,000,000
G	Engineering Design	Project Engineer	$10,000,000
G	Engineering Design	Project Manager	$10,000,000
G	Engineering Design	Project Manager	$10,000,000
H	Engineering/Construction	Executive Director	$5,000,000
H	Engineering/Construction	Executive Director	$5,000,000
I	Construction Management	Vice President	$2,000,000
J	Construction Management	Account Executive	$2,500,000

2.1.3 Phase I Study Survey

The survey consisted of two parts, a facesheet and the survey questions. The face sheet was used to solicit general information about the interviewee and was administered prior to the survey questions. The body of the survey consisted of a series of open-ended questions designed to elicit the participant's opinions in the following 15 thematic areas:

- Features of the Owner/Contractor Work Structure
- Nature of the Owner/Contractor Relationship
- Benefits of an Owner/Contractor Relationship
- Level of Owner Involvement
- Coordination between the Owner and the Contractor
- Monitoring and Evaluation of the Contractor Performance by the Owner and Contractor
- Attributes of a Successful Owner/Contractor Relationship
- Owner/Contractor Relationship Learning
- Areas of Conflict
- Impact of Alliance on Owner/Contractor Relationship
- Areas for Improvement
- Skills Required by Contractor Project Personnel
- Skills Required by Owner Project Personnel
- Issues and Challenges
- Additional Issues

2.1.4 Data Collection and Analysis

To collect these data, the Contractor Phase I Survey was administered by telephone interview to the candidates in the sample. The interview date and time was scheduled in advance, based on the participant's availability. An electronic copy of the survey was forwarded to the participant several days before the interview for their review.

The same interviewer conducted all of the telephone interviews. In each interview, the survey questions were asked in the order in which they appear in the survey instrument. At the discretion of the interviewer, the survey instrument questions were supplemented by open-

ended probe questions to either clarify responses or encourage the participant to elaborate on prior responses. The amount of prior preparation by the participants varied from no prior preparation to participants completing the survey prior to the telephone interview. The interviewer hand recorded the responses on the survey form as the questions were answered. The data logged was a mixture of direct quotes, paraphrased comments, key words and sentences. When requested, a record copy of the interview notes was sent to the participant.

Since most of the data obtained was qualitative, the data analysis consisted of consolidating the responses within the fifteen thematic areas and identifying trends within each area. Where applicable, frequency analysis of the responses was used.

2.1.5 Sources of Error and Bias

This section discusses the validity and reliability of these data by exploring the sources of error and bias in the data collection process. Threats to the valid interpretation of data are broadly divided in to three groups: error associated with the sampling method, error from the investigator and error from those being studied (Webb et al., 1981).

The external validity of the Phase I Contractor Study is limited due to the use of the nonprobability sampling method. The consistent degree of response replication among the participants and the similarity of these findings to those from the Phase II Owner Study lend credibility to the internal validity of these data. The use of the same interviewer to conduct all of the telephone interviews coupled with the interviewers extensive experience in this field could have created interview competence bias. The survey design utilized exclusively open-ended questions to minimize change agent and response set bias. Despite its limited external validity, the internal validity of these data from the Phase I Contractor Study makes it a suitable basis from which to formulate a more comprehensive initiative.

2.2 Phase I Contractor Organizational Changes Study Findings

The following discussion provides a summary of the study team's key findings in each of the fifteen topic areas based on the contractor representative interviews.

2.2.1 Features of the Owner/Contractor Work Structure

There was general agreement among the individuals interviewed that one of the most defining change in the owner/contractor work structure over the last five years has been the explosive increase in the outsourcing of design, engineering, construction, and owner representative services by owner firms. The reasons cited by contractors for this trend were: the downsizing of the owners internal design/engineering functions, the economic leverage that outsourcing provides owners in utilizing these services on an "as need basis" and the owner's desire to access industry expertise and technology innovation.

The outsourcing of these functions has been accompanied by two secondary trends: first, a shift in the types of services requested by owner firms and second, a change in the classification of design/engineering services by owner firms from a custom to a commodity service. The consensus is that this reflects the displacement of the Engineering Department by the Finance Departments within owner organizations in the acquisition of these services.

There was general agreement that technology has had a positive impact on the owner/contractor work structure by improving everyone's ability to monitor, track and evaluate performance. This has in turn raised owner and contractor performance expectations, improving both the project management process and the overall quality of the projects.

Market globalization and the owner requirement to shorten the "time to market" by compressing the overall project schedule was cited as the one of the most significant industry changes. This is adversely affecting the quality of the design documents by reducing the design coordination period manifesting itself in coordination problems during construction. The increased technical complexity of modern facilities and the burgeoning ranks of consultants that are required on the design/construction team further exacerbate the coordination issue. These factors serve to increase the risk to the owner.

2.2.2 Nature of the Owner/Contractor Relationship

Representatives from all ten firms in the sample reported the existence of some form of multi-client owner/contractor relationships. Of those reporting a formal owner/contractor relationship, these relationships were codified in a contract based on a specific rate structure; i.e., cost of design services per square foot of space categorized by type of space or hourly rates. Those reporting an informal owner/contractor relationship exclusively classified these relationships as that of a preferred supplier, either sole source or pre-selected.

The development and implementation of owner-contractor relationships was found to have a distinct hierarchical component. Almost without exception, relationships were developed at the owner-contractor *management* level and implemented by owner-contractor *project* level personnel. The formations of the majority of the relationships, regardless of the type, were preceded by the completion of a successful project. Table 2.2 summarizes the information.

2.2.3 Benefits of an Owner/Contractor Relationship

The most frequently cited contractor benefits of an owner/contractor relationship were: the reduction in business development costs, more efficient targeting of marketing resources, a consistent flow of work, a higher level of service based on a knowledge of the clients wants and needs, and early entrée into the capital facility project planning process.

Study participants estimated the reduction in business development costs ranged from a $20,000-$30,000 savings on a $20M project to an annual savings of $1 million from the reduction of proposal costs and elimination of a sales force. Few organizations were able to supply any detailed measure of any of these benefits. The one firm that did trend the marketing costs for their owner/contractor relationships found these costs to be on the low side of historical marketing costs for a similar non-relationship based large project. As a part of a collaborative relationship, they found their marketing dollars being spent less on project proposal preparation and more on relationship development and maintenance.

In the area of consistent workload, only three of the firms were able to provide measures of their repeat business, 65%, 70% and 90% respectively. One firm used work backlog as a measure of workload, and indicated that their owner relationships currently

Table 2.2: Contractor Relationships by Number and Type

Firm	Firm Classification	Number of Relationships	Type
A	Engineering Design	15 – 20	Formal /Contractual
B	Construction Management	3	Informal/Preferred Supplier
C	Arch./Engineering Design	3	Informal/Set Rate Structure
D	Engineering Design	9	Informal/Preferred Supplier
E	Arch./Engineering Design	Not provided	Formal/Contractual & Informal/Preferred Supplier
F	Construction Management	Not provided	NA
G	Engineering/Construction	Not provided	Alliance/Continuous Service Agreements
H	Engineering/Construction	50	Alliance/Partnerships Informal/Formal
I	Construction Management	25	Alliances Informal/Formal
J	Construction Management	Not provided	Relationship-based Formal/Informal

accounted for a 2-year backlog of work for the firm. The point was made that while this work can be counted on, it was often difficult to schedule.

Knowledge of the client's needs and expectations was fundamental to flattening the learning curve and improving the level of service to the client by matching the level of service to the client's needs. This created a more efficient fee structure and, in turn, expanded the contractor's business base.

Many of those interviewed felt that an owner/contractor relationship gained them early entrée into the capital facility project planning process. This allowed the contractor knowledge of and valuable input into both the strategic planning and tactical project parameters. A long-term relationship removes the "make a quick buck through change orders" mentality that capitalizes on the lack of design detail. It reduces risk and encourages everyone to identify problems as early as possible in the process.

The only disadvantage cited by the interviewees, was that of a lower fee structure. The owner expected to realize learning curve efficiencies in reduced fees that they expected the contractor to be compensated for by improved efficiency.

2.2.4 Level of Owner Involvement

The level of owner involvement was inconsistent both across owner organizations and within specific owner organizations. The only general trend was that owner involvement is drastically less today than in the past due to reduction in owner personnel. Owner firms, in general, desire "success with minimal time investment." The owner is hiring contractors with the expectation that they will do the job right the first time.

There was a minority opinion that owner involvement is heavily influenced by the project delivery system; i.e., traditional, design/build, Owner/CM. In a traditional approach, the owner is more the decision-maker and point of contact, so the client is more involved. In an Owner/CM approach, the owner is more "hands off" since they have hired a professional and want to let him do his job.

2.2.5 Coordination between Owner and Contractor

Three types of coordination were reported: owner/contractor project based coordination, internal contractor project coordination, and owner/contractor relationship coordination.

The tactical owner/contractor project based coordination took the form of weekly/bi-weekly project design and construction meetings, monthly schedule/cost/quality reviews, and less frequently, project closeout evaluations. When projects were formally closed out, the most common mechanisms were project specific lessons learned sessions, client satisfaction surveys and metrics based project performance evaluations. The contractor's project manager almost exclusively handled the tactical project coordination. Depending on the relationship, the monthly meeting might be attended by both the contractor's project manager and the project executive.

All of the firms reported that they supplemented the owner/contractor project-based coordination process with a formal, regular internal management review process of ongoing

projects. Typically, each of the firm's clients is assigned a Division Leader or Vice President to monitor the project process through project status reports to insure the project is heading in the right direction and to intervene as required.

A formal program for coordinating the strategic owner/contractor relationship was rarely reported to exist within the contractor's organization. Where it did exist, it was based on hierarchical position, with the more senior members of the contractor's firm responsible for this activity, generally on an ad hoc basis. An example of this leadership hierarchy is as follows:

- Project Manager (PM): primary client contact, responsible for billing, manages in-house project team and adherence to budget
- Project Designer (PD): responsible for determining the clients intended building program
- Project Architect (PA): responsible for the adherence to codes, regulations, technical competency and production of the client's space planning program

Other firms used the position of Project Executive to form the tactical/strategic bridge between the contractor and the client, with a Vice President available to provide crisis management support.

2.2.6 Owner & Contractor Monitoring and Evaluation of Contractor Performance

The contractor's performance on the "last project" was the method most frequently used by the owner and the contractor to monitor and evaluate the contractor's performance. The process was succinctly described as the contractor being "as good as your last project." This evaluation usually had no rigorous quantitative measure of performance, but was based on "perception and gut feelings." It was viewed as being predominately a reflection of the quality of the personal relationships across the individuals involved.

Clients rarely initiate these evaluations. When the client did participate, extracting input was a laborious and painful process. The most frequently practiced performance evaluation process initiated by a client was "contesting a billing". Several contractors indicated that this was usually the first indication that there was a problem.

As contractors come to rely more and more on a stable client base and the accompanying repeat business they are beginning to institute relationship reviews. An example of this is the Relationship Success Planning Program instituted at the management level by one of the sample firms. Prior to the start of a project, a Principal and Project Manager are responsible for identifying the owner-specific goals/objectives/fees and transmitting this information to the specific design team. Another firm conducts formal 30/55/89% internal project audits prior to the customer review. This firm is also in the process of developing formal engineering QA/QC procedures.

Several survey participants commented on the trend among owners to hire outside vendors to oversee the architects, engineers and construction managers; i.e., an outside architect to oversee the design architect, an outside owner's representative to oversee the CM, etc. They expressed some concern that this set up an adversarial, highly competitive environment characterized by the overseeing firm seeking to find fault with the primary team in order to prove their value to the owner. This often results in unnecessary redesign by the primary design team and a redundancy of costs to the owner. (Note that the oversight function was in many cases performed by owner personnel in the past.)

2.2.7 Indicators of Successful Owner/Contractor Relationships

A successful project was cited as the undisputed, primary indicator of a successful owner/contractor relationship. The second most commonly cited indicator of a successful relationship was the quality of the owner/contractor communication. Contractor's used the following measures to rate the quality of owner/contractor communication: the ability and willingness of the owner to be honest and open with information, the owner's ability to give "crystal clear" direction with regard to project goals, schedule, project team roles and responsibilities, budget, etc., to provide positive feedback and to seek input and advice. The third attribute of a successful owner/contractor relationship was access to the owner decision-maker. As owner firms increase the scope of the services that they outsource, they distance and insulate themselves from the process. This is creating barriers to communication and delays in the decision making process. Other indicators of a successful owner/contractor relationship, listed without regard to order, were: positive team dynamics with shared team traits, similar corporate cultures, an organized owner project approach, qualified owner

personnel, quantitative measures in place to monitor and evaluate the project, and an owner that is enthusiastic about the process and the project.

The following were some of the indicators of a poor relationship, listed without regard to order: not having timely communications, erosion of owner responsibility and authority, cultures negatively disposed to outsourcing, and the owners failure to clearly and concisely identify problems.

2.2.8 Owner/Contractor Relationship Learning

Contractor firms are currently much more adept at converting individual project knowledge to organizational project knowledge than they are at converting individual owner/contractor relationship knowledge to organizational or interorganizational relationship knowledge.

All of the firms interviewed have formal processes to capture individual and organizational project-based knowledge. The conversion mechanism usually takes the form of a project specific database that lists project size, costs, schedule, contact points, billing rates, lessons learned and project results. This information is usually resident in the marketing department and is used primarily in preparation for the next project.

Client specific or relationship knowledge is maintained primarily as individual knowledge in the form of individual memory specific to these who interacted with the client, i.e., Project Manager, Lead Designer, etc. This information is usually passed on as oral history. The firm retains access to this information for the duration of the individual's employment and relationship with the client.

Feedback from the survey participants indicates that they are becoming increasingly aware of the competitive importance of improving the process of converting individual knowledge into organizational and interorganizational knowledge. Attempts to do this are only in their initial stages and are manifesting themselves in a number of ways, i.e. increased document standardization, increased owner/contractor interaction across the entire contractor project team, more frequent internal staff/client debriefings, and internal project kickoff meetings.

2.2.9 Areas of Conflict

The most prevalent area of conflict within the owner/contractor relationship is the owner's lack of understanding of the overall Design/Construction process and the unique role that the owner plays in this process. Among the manifestations of this issue cited by the participants were lack of an adequate time commitment by the owner to the process and the project, lack of an empowered single point of contact within the owner organization, lack of accessibility to owner decision makers by the contractors, managing "late breaking" owner changes, lack of owner staff continuity, and lack of information compounded by delayed decisions.

The contractors found the latter two items particularly onerous. They complained of frequent delays in the decision making process because the owner representative was not empowered by their organizations or lacked access to the individuals empowered to make decisions. Contractors found this particularly true of facility/operations groups. They are the primary internal owner customer and project points of contact within the owner organizations but are limited in both decision-making authority and access to the people who have the power and make the decisions.

The lack of continuity within the owner's project management staff, euphemistically entitled "Bungee Managers," caused major ramifications within the contractor's project staff and management. Each time the owner's management staff changes, and it changes frequently, the Contractor is required to change his staff to address allegiance concerns on the part of the new owner management. In an attempt to insulate the project management team, several contractors have instituted a two-tiered strategic/tactical relationship with their clients. A client representative is designated for each owner and is responsible for cultivating the relationship with the owner's manager of projects. As the owner management team changes, the contractor need only replace the client representative, leaving the project team intact, insuring the continuity required to successfully manage the project.

Personnel assignments and personnel availability were another area of substantial conflict. The owner expects the contractor to dedicate people to their company or site with instant availability. Plant managers tend to want the best of both worlds, people who know the

company and site, but who are on site only "as needed." In crisis, they want an instant response with little or no notice, which is problematic for contractors trying to optimize their employee's billable hours.

2.2.10 Areas for Improvement

Based on the changes that the interviewees have observed in the owner/contractor organizational structure over the last five years, they have identified several areas for improvement within their firms. These areas are as follows:

- Overcome the increasing distance between the Contractor and the Owner. One strategy is to develop multi-level owner-contractor relationships at the project, middle management and management levels. A corresponding contractor representative is assigned to interface and monitor each relationship level.
- Become more selective in the types of projects and the owners that they work with. Establish more strategic alliances and long-term client relationships.
- Work to better understand the client: their needs, expectations, objectives, what they are trying to do.
- Make better use of teambuilding techniques as an alignment tool.
- Demand that the owner business representative is involved in the early project development.

2.2.11 Impact of Alliances on Owner/Contractor Relationship

All of the respondents felt that the existence of any form of owner/contractor relationship positively enhanced project performance. Among the benefits most often cited were:

- The owner has much more realistic expectations for projects performed within the context of a relationship. With a relationship, the process is valued as much as the result.
- Projects tend to be more successful overall, reflecting the higher level of communication, trust and knowledge of the client needs.
- Projects are generally much more financially successful for the contractor, since it takes less time to sustain a relationship than it does to create one.
- A relationship changes the emphasis of the evaluation process from the performance on the last project to a more "overall" relationship evaluation.
- A long-term working relationship dramatically improves project performance. One contractor indicated that rework has been reduced from 2.5% to 1% over the last five years on relationship projects.

- A relationship removes the "make a quick buck" mentality through change orders that capitalize on the lack of design detail. It also reduces the risk and encourages everyone to identify problems as early as possible in the process.

2.2.12 Skills Required by Contractor Project Personnel

Within the competency requirements for contractor project personnel, there has been a major shift in emphasis from technical skills to communication and interpersonal skills. The magnitude of this shift is best illustrated by the following quote from one respondent, "I would take an individual with good relationship skills/mediocre technical skill over an individual with high technical skills/low people skills." Contractor personnel, regardless of their position, have to wear so many "hats" and interface with so many different types of people that their primary skills have to be the ones that allow them to interface with the myriad of people who now compose the typical project team. Industry specific technical skills, project process knowledge and computer skills were the next most highly rated skill bundle, followed by business knowledge.

An increase in the quality of the individuals entering the contractor ranks was noted. In the past, people rose through the industry ranks. Now, more people are entering the industry with a college education.

2.2.13 Skills/Traits Required by Owner Project Personnel

Contractors increasingly view the owner's representative "as the organizational translator and guide." Since the project team is increasingly composed of non-owner personnel, a good grasp of the owner organization's goals, values and objectives by the owner's representative are a highly valued skill. One participant articulated this as; "the owner representative needs to come to the table with competent understanding of how the business currently works and how it will work in the future, and a good business plan that can be turned into a building." Other skills/traits/characteristics highly valued by the contractor in owner project personnel were: leadership, confidence, good listening skills, availability, the ability to make decisions, access to the decision makers, genuine enthusiasm, the ability to "think on their feet", a willingness to share ideas, the ability to motivate, the ability to work in teams, the ability to build trust, and the ability to manage conflict.

The participants were at odds over whether the quality of the people within the owner's organizations has improved or declined.

2.2.14 Future Industry Issues and Challenges

The participants produced a varied listing of the issues and challenges that face the industry in the future. The main themes were:

- The adverse impact of schedule compression on the quality of projects. Project teams are being challenged to successfully design and build increasingly complex facilities within ever-shrinking schedules. With owners outsourcing most of the design and construction services, it is not unusual for the project team to have 30 outside technical consultants in addition to the primary design team. Design coordination is being sacrificed in order to meet the compressed schedule requirements. The resulting poor quality of the design documents adversely impacts the construction schedule, driving up the cost and increasing owner risk.

- Quality communication is fundamental to the success of a project. Continuing to leverage technology to further improve communication by improving the sharing and routing of information among the project team members; designer, owner, construction manager, contractors and subcontractors represents a tremendous opportunity for improved industry efficiency.

- With so much work, people are being asked to do things that they have never done before. Finding qualified individuals to meet the demands of the industry at all levels, from the trades through project managers, was cited as another industry issue. Availability of qualified senior people is already becoming an issue. With the escalating workload, several participants expressed concern and frustration about their limited ability to mentor subordinates, further eroding the pool of qualified individuals.

- Owners are building all over the country and all over the world. The challenges facing the industry in supporting this mobility is causing quality of life issues for the contractor project staff.
- Entry-level project staff has different occupational status expectations than their predecessors. New employees enter the workforce with very clear ideas about what roles and responsibilities are position appropriate and are viewed to lack the "I'll do anything attitude" of their predecessors.

2.2.15 Additional Issues

When asked to address issues not covered by the survey, the interviewees provided the following summary comments:

- Technology has eroded the ability to practice time management because of information overload. Faster information is not necessarily more efficient. There are too many ways to send and receive information and it is hard to ignore any of them. The anonymity that technology has created has undermined some of the rules of business etiquette. This has created the "Drop a Bomb" syndrome often resulting in e-mail and voice mail "wars". The result can be a very adversarial relationship among the team members.
- Construction managers make decisions on selection of material, approve substitutions, and control the budget, yet they bear none of the professional liability for the results of the changes that they initiate. Several respondents suggested that it would be appropriate to license construction managers, much as architects and engineers are licensed.
- The lack of consistent, company-wide standards or reporting requirements within owner companies causes added cost and inefficiency for contractors.
- Providing a quality product in the face of a constant decline in the competence of the sub-contractors, the number of competent subcontractors, and declining trade competence is an industry challenge.
- Alignment from the contractor side is an issue. The owner has all of the money. If the contractors want to do business with an owner, they have to be strategically aligned. Contractors have to identify the clients "delight factors" and communicate them to their personnel.

Chapter 3
Findings and Future Work

3.1 Findings

The authors have conducted 13 extensive interviews with individuals from 10 firms in Phase I of the Contractor Study. While the sample size of the Phase I study is not sufficient to create the external validity required for this study to be considered representative of either the contractor community or the construction industry; it has allowed the research team to identify several findings that, combined with previous research in the areas of organizational change, business relationship development, network management, and organizational learning, provide a basis for future work. These findings are:

- The literature review has demonstrated that there has been little research conducted in the area of organizational change that focuses either on the construction industry or the contractor community. The only exception is the work currently being conducted by CCIS in this area from the owner perspective. The Phase I Contractor Study was the first step in identifying the issues and challenges regarding this topic area.

- The Phase I Contractor Study noted that the single, most defining change in the owner/contractor organizational structure over the last five years has been the explosive increase in the outsourcing of design, engineering and construction management services by owner firms, much of it in the form of collaborative relationships. All of the firms in the Phase I Contractor Study reported that they were involved in some form of owner/contractor collaborative relationship. Many noted that these relationships have become the major source of their business.

- Contractors and owners have different perceptions of the nature of collaborative relationships. Since neither party understands the intricacies of why a collaborative relationship is successful, they are unable to manage their collaborative relationships. They default to managing the relationship outcomes. To paraphrase the Deering and Murphy (1998) quote, owners and contractors manage the bricks that make the castle, not the mortar that separates and binds them.

- A major shift from technical skills to communication and interpersonal skills within the competency requirements for contractor project personnel was also noted in the Phase I Contractor Study. Contractor personnel, regardless of their position, have to wear so many hats and interface with so many different types of people that their primary skills have to be the ones that allow them to interface with the myriad of people that now compose the typical project team. Finding individuals who can perform these skills is problematic.

- Although owners desire to learn from contractors and cite increased learning as an important benefit of alliance and preferred provider relationships, the Phase II Owner Study reported that owner firms still do not have systematic structures for assessing and documenting their learning from contractors. The Phase I Contractor Study noted a similar trend in the contractor community. Contractor firms are currently much more adept at converting individual *project* knowledge to organizational *project* knowledge than they are at converting individual owner/contractor *relationship* knowledge to organizational or interorganizational *relationship* knowledge. This constrains their ability to perform effectively in collaborative relationships.

The literature review and Phase I Contractor Study confirm that collaborative relationships provide the functional flexibility required to compete in the current dynamic marketplace. As more organizations implement the core competency/strategic outsourcing strategy to improve their competitive advantage, contractor organizations will be forced to participate in network business relationships with their client firms. The uses of collaborative relationships within the construction industry to allow organizations to extend their areas of expertise, improve their market penetration, and expand their market coverage will increase as well. The inability of the construction industry, or individual firms, to effectively implement and interface with the use of network business strategy through collaborative business relationships will substantially limit the continued development of market opportunities. Phase I Contractor Study was the first step in identifying the issues and challenges in this topic area.

3.2 Future Work

In order to build on the foundation of the findings of the this study, future research, in conjunction with the Owner Organizational Changes study, is needed to map the Owner/Contractor Interface, identifying the areas of alignment and misalignment. This should allow researchers to identify factors and processes to that will assist contractors and owners to reconcile areas of misalignment and improve the management of this interface. The ultimate goal of this research is to enhance the utilization and performance of Collaborative Relationships within the construction industry and improve the overall performance of the construction industry.

Collaborative relationships exist in the business environment to achieve tangible results for the partners. Relationships in and of themselves have historically proven difficult to measure and evaluate in other than a qualitative basis. To provide a quantitative measure for this research study, the performance of capital facility projects should be selected as the unit of analysis. The causal relationship that is the focus of this future research is that capital facility projects developed and executed within a collaborative relationship are more successful.

A two-stage data collection process is proposed for this research project, one for the collection of the owner-contractor relationship and project performance data and one for the collection of the primary human resources data.

The Phase I Contractor Study found a distinct hierarchical component to the development and implementation of owner-contractor relationships. Almost without exception, the study found that these relationships were developed at the owner-contractor management level and implemented by owner-contractor project level personnel. To capture the strategic and tactical nature of owner-contractor relationships, a multi-level data collection process is being proposed to collect the owner-contractor relationship and project performance data in this research project. A survey will be developed and administered to the candidate firm management representative, e.g. Vice-President of Business Development or Vice-President of Design/Engineering. This survey will focus on the strategic nature of the owner-contractor relationship and documents the strategic details of each of the candidate projects. A second survey will be developed and administered to the project manager of each of the candidate projects. This survey will focus on the tactical nature of the owner-contractor relationship and document the tactical details of each of the candidate projects. Each survey will be administered during a face-to-face interview conducted at the candidate firm's site by a member of the study team.

The Human Resources data will be collected using a separate survey administered to the human resources representative responsible for hiring project personnel. This portion of the research will focus on the identifying the skill competencies required to effectively manage collaborative relationships and the mechanisms used to develop these competencies.

In summary, many of the same issues facing owner organizations also are problematic for contractors. The business environment has changed drastically and only those firms willing and able to adapt will survive and prosper.

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