

LEADERSHIP VS. MANAGEMENT IN THE CONSTRUCTION INDUSTRY

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Construction and project management has become a vital component of the delivery of construction. The hypothesis of this research is that the dependence on the characteristics and functions of management to deliver construction has a direct impact of increasing the risk of nonperforming construction, leading to performance issues. It is also proposed that a leadership structure is more efficient than the current management based structure, and will lead to increased construction performance. An efficient process uses leadership characteristics of empowerment, trust, self assessment by the timely use of performance information, and the measurement of a contractor's ability, to identify, prioritize, and minimize risk. A leadership structure results in a "win-win" relationship between clients (best value) and contractors (maximized profit). This research proposes that the use of a leadership oriented process may minimize the inefficiencies of the construction industry. Research is being proposed to explain the importance of moving to a leadership environment to the construction industry using information concepts. The objective of the research is to identify the characteristics of leadership and management, identify the relationship between the use of performance information, an information environment and leadership, and then develop a leadership based education which will use the information based processes to assist project/construction managers move to a leadership style. Management has a direct relationship to inefficiencies of delivery processes, and results in the inefficient or non-value added functions of control, management, and minimum quality construction. The research used deductive logic, previously published Information Measurement Theory (IMT) models, successful business practices, and results of management and leadership principles by Maxwell, to validate this hypothesis.

Keywords: leadership, information environmentt, non-performance, performance-based.

INTRODUCTION: CURRENT CONSTRUCTION INDUSTRY PERFORMANCE

The construction industry has been defined in terms of competition and performance (See Figure 1) (Kashiwagi 2002). The worldwide competitive price pressure has forced the construction industry into high competition with minimal standards/requirements, a commodity sector where the best value is the "lowest price" (Warseck 2002). This environment has the following characteristics:

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1. Construction and project management becomes a critical component (Post 2000).
2. Price based environment. Even though performance may be considered, and prequalification is used to eliminate non-qualified contractors, the project is awarded and measured on price (Herbsman & Ellis 1992).
3. Practices are implemented which do not motivate efficiency or quality (designers paid by the hour, minimal standards, and no credit given for high quality work) (Kashiwagi 2002).

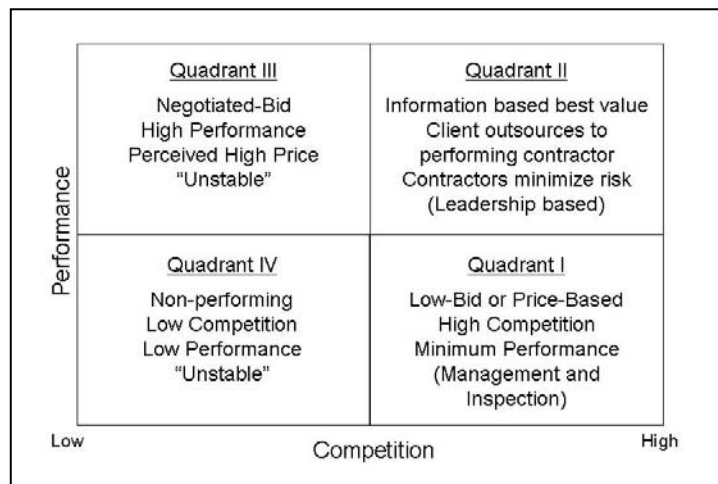


Figure 1: The Construction Industry Structure (CIS) model

The research proposes that in Quadrant I, the client representative's technical expertise is required to manage, direct, and control the construction of the priced based awarded contractor. The Quadrant I structure is management based. The following management functions and characteristics are required:

1. Specifications, minimum standards, and requirements.
2. Direction, control, and inspection by the client representative.
3. Separation of the parties making the decisions (client's project or construction manager) and those that accomplish the work (contractor).

The results of Quadrant I management based construction environment include:

1. Customer dissatisfaction, construction not completed on time, nor within the bid price, and owners not wanting to work with contractors again (Egan 1998).
2. High demand for independent construction and project managers (Kashiwagi 2002).
3. Lack of quality and skilled craftspeople (Battersby 2000).
4. High insurance and bonding rates due to construction non-performance (SIO 2003, Morgan Insurance 2003, Construction Chart Book 2002).
5. Adversarial environment caused by the owner's minimum standard being treated by the contractors and vendors as a maximum value to ensure getting work and making a profit (Drucker 1999, Advice 2003).

It is this adversarial environment that increases risk while at the same time requiring technical expertise and management to minimize the risk. The owner representatives

use minimum standards and price based awards to obtain the lowest price (Figure 2a). In a price based award, the contractors do not receive credit for any performance above the minimum standard or requirement, forcing them to provide the lowest acceptable performance (Figure 2b). Continuous improvement, efficiency, and high quality, although noble efforts, are not conducive in this environment. The low bid does not typically include contractor contingencies, risk minimization, or the correction of errors in the specifications and drawings. This increased risk forces the client to hire professionals to attempt to manage, direct, and control the increased risk. Management, by definition, is a manifestation of inefficiency. High performing contractors do not have to be managed or inspected. Only marginal contractors who are price based need to be inspected. This inefficient use of both the client and the contractor's resources has resulted in non-performing construction. The non-performance can be captured by the following statistics (Egan 1998, Vickers 2000, State of the Construction Industry Report 2000, Post 2002):

1. 33% of projects in the US are over budget.
2. 53% of clients in the US do not want to have a relationship with the contractor at the end of construction.
3. Only 68% of clients in the UK would give an 8/10 rating or better on satisfaction.
4. Only 45% of clients in the UK stated that the costs were on target.
5. Only 62% of clients in the UK stated that the projects were completed on time.

An efficient environment is when all resources of the client and the owner are used to produce performing construction. If performance is not achieved, resources are being inefficiently used. The most efficient environment is a "win-win" situation. The "win-win" is identified as the owner receiving best value (high performance at the lowest price) and the contractor being efficient (maximizing profit). Without the two interests being aligned, the result would be an inefficient, adversarial environment where resources are wasted to protect a party (Covey 2003). The entire delivery process must become efficient (both the client and the contractor's functions.) Quadrant I is defined by management functions. Managers use standards and rules to force entities with different capabilities to perform to the same standard. Deming has identified this action as ineffective and a "lack of leadership." Deming (1982) states that managers often perceive that an environment that can become more efficient when, in actuality, it is already stabilized. A stable environment (one that has maximized its efficiency or needs to be constantly changed to impact output) can only be improved by a new process (1982). The construction industry has tried numerous solutions to solve the poor performance, the inefficiency, and the win-lose environment of the management based Quadrant I environment (Green 2001). Solutions have included: partnering, lean construction, business process reorganization, continuous improvement, prequalification, construction management, and supply chain improvement. However, all these solutions have had the following characteristics:

1. They are proposed by professionals who have managed, controlled, and directed construction.
2. They all include a key role for managers or expand the management role.
3. The solutions are management based.

Professional construction management and client's project management have become institutionalized in the construction industry. The construction management professional has become the key component of the price based Quadrant I environment (Post 2001). The US federal government has been attempting to move from the price based environment to a more successful performance based environment (Quadrant II) (Angelo 1997). However the move has been very difficult (Tulacz 2000, DOC and OFPP 2002). In Quadrant II, the client selects the best value contractor by considering both price and performance. The paradigm is simple. Hire the best performer, allow the performer to do work efficiently, and the result is minimization of effort, best price, and high performance. The high performing contractors have the expertise in planning, risk minimization, construction, and quality control. The client's representative's need to technically manage, direct, control, or inspect, can be minimized. The major obstacle in moving to a performance based environment (Quadrant II) is that the new environment is not management based, but leadership based. With the key component being contractor performance and expertise, the construction professional's role in managing, controlling, and directing is diminished. The professional now can focus on the planning, programming, and design. The professional also has a new responsibility of knowledge management (the use of performance information at the right time creating the performance environment) (Egbu 2002).

This research proposes that the results in Quadrant I (listed previously) show that it is an inefficient environment. The client's perception of this performance has led to more management and less faith in the construction industry (Colton 2004). The problems of the management based environment cannot be solved unless a move is made to Quadrant II (high performance and unrestricted competition.) Solutions that attempt to change the outcomes in Quadrant I have been ineffective. Unless the solution includes the movement to a Quadrant II environment, and the minimization of the management based environment characteristics, the value of construction will not be improved. The authors propose that the obstacles in moving from Quadrant I to Quadrant II include:

1. Construction management professionals in construction research will resist the perceived movement to minimize their profession.
2. Designers are comfortable with using minimum standards. They will resist retraining.
3. Individuals who profit from the adversarial environment of mistrust in Quadrant I will resist the move due to the minimization of their roles.
4. Low performing contractors will resist a move to Quadrant II due to their inability to compete in the value based environment.

The opposite of a management based system is a leadership based system. Maxwell (1998) proposes that many people confuse management with leadership. Maxwell states that management maintains and controls; leadership influences, and creates opportunity for people to change and perform. There are three major components in the delivery of construction: the client and their representative, the contractor, and the delivery system. The authors propose that all three components must take on the characteristics of leadership instead of management. The delivery process must act as an "invisible" leader by attracting high performance contractors, allowing them to compete without subjective qualifications while empowering them to succeed. It will allow the performing contractors to minimize risk instead of depending on the

professional's expertise to minimize the risk. This proposes a monumental challenge to the construction management professionals who pride themselves on managing and controlling.

THE CHARACTERISTICS OF LEADERSHIP

Maxwell's Business Week's best seller for over a year identifies "21 Irrefutable Laws of Leadership" (1998) defines leadership with the following characteristics:

1. Perception. Leadership ability *identifies* a person's level of effectiveness.
2. Influence instead of control. Leadership is about *influencing* people to follow, while management focuses on maintaining systems and processes.
3. Improvement. Managers can maintain direction, but they cannot *change* it.
4. Followers motivated to perform. To be a leader, one must not only be out in front, but also have people intentionally coming behind, *following* the lead, and *acting* on the leader's vision without coercion.
5. Voluntary instead of regulatory involvement. The very essence of leadership is getting the other person to *participate*.
6. Assumption of ignorance and lack of expertise. As long as a person doesn't know what he doesn't know, he doesn't grow. To be conscience that *you are ignorant* of facts is a great step toward knowledge.
7. Listening instead of giving directives. Navigators *listen to what others say*, examine before making commitments, and make *conclusions based on fact* and faith. Leaders don't speak a lot and don't do work. Real leaders speak later, need only their own influence to get things done, and influence everyone.
8. Prediction. A leader is one who sees more than others see, who sees farther than others see, and who sees before others do.
9. Results oriented. The proof of leadership is in their followers or performers.
10. Trust. Character (honesty and doing what is best for everyone) makes trust and trust makes leadership.
11. Efficiency. Leaders maximize every asset and resource for the good of the organization. Leaders understand requirement, greatest return, and priorities.
12. Differential. Leadership levels: those who naturally see it, those who are nurtured to see it, and those who will never see it.
13. Measurement in terms of non-technical characteristics. Leadership is more art than science. Also the heart comes before the head.
14. Flexibility. Leadership is based on intuition and changes with every situation.
15. Environment definition. The environment is the person. Who you are is who you attract. Who you are dictates what you see.
16. Challenge. The tougher the job, the greater the connection.
17. Empowerment. Hire the best staff, develop them as much as possible, and hand off everything to them. The people's capacity to achieve is determined by their leader's ability to empower.

18. Environment. Create an eagle environment. Leaders find a way to win. It takes a leader to raise up a leader. Leaders find the dream, then find the people. People find the leader, than find the dream.
19. Alignment. A team doesn't win if the players have different agendas.
20. Minimized activity. Leaders understand that activity is not necessarily accomplishment.
21. Thinking of others or "win-win." A leader must give up to go up.
22. Timing. Right time, right action.
23. Sustainability. Legacy of leadership is succession.

The hypothesis is that these characteristics also describe performing contractors. If an environment can be created which requires these characteristics, performing contractors can be successful (on-time, on-budget, and meeting client's expectations). The performance based environment must then attract performers, provide a win-win relationship, be efficient, be result oriented, motivate trust, minimize control, listen more than directing, predict the outcome, and document the performance.

QUADRANT II (PERFORMANCE BASED ENVIRONMENT)

The performance based environment competitively awards projects based on performance and price. Performance based procurement is a leadership based structure. The differences between Quadrant II from Quadrant I include:

1. Identifies performing contractors who can minimize risk before the award.
2. Awards the contract based on the value and contractor's efficiency.
3. Minimizes client's direction and allows contractors to use their expertise.
4. Minimizes the amount of data passed, minimizing the need of client management, and assigning responsibility.
5. Forces contractors to do self assessment of their value and performance and continually improve.
6. Forces the contractors to coordinate, verify, clarify, and identify a clear plan to minimize the risk before the award of the contract.
7. Creates an environment where the high performing contractors regulate the awarded contractor's value.
8. Puts the contractor who gets the award at risk in terms of future competitiveness.
9. Creates an environment of risk where only performers can be competitive.

The new environment uses best value instead of minimum requirements. This minimizes the need of standards, inspection, and regulation. By definition, high performers will be more comfortable in this environment. These best value contractors should be competitive, highly motivated, trustworthy, honest, have great character, think "win-win," be efficient, continuously measure themselves, be results oriented, utilize performers, and act highly predictable. They should have a competitive advantage when a client is looking for value.

Performance based procurement is the current buzz word as US federal agencies attempt to move to a Quadrant II environment. However, if the client's procurement

representatives are not leadership based personnel, or their process does not have the characteristics of leadership, their efforts will fail because they are still management based using Quadrant I methods. The Performance Information Procurement System (PIPS) is the only documented performance based process exhibiting the 23 leadership characteristics discussed above (Kashiwagi 2002). PIPS has been developed over the last ten years in a \$4.2M research effort, and tested 380 times on \$230M of construction. It differs from other systems because it has minimized management, empowered contractors, and has resulted in the performance concepts being utilized down to the construction craftspeople (Maughn 2000, Hiramatsu 2003). The results of PIPS include (Kashiwagi and Byfield 2002, Kashiwagi and Savicky 2003, Advice 2003):

1. Reduction of client decision making, management, and inspection by as much as 80%.
2. Minimization of minimum requirements, documentation, and rules.
3. Consistent performing results (98% of projects with customer satisfaction, no contractor generated cost change orders, and completion on time).
4. 99% statistical probability of PIPS delivering higher performance than the price based projects.
5. Continuous improvement of contractors. Lower first costs than price based projects with much higher performance.

The result of creating a leadership environment has minimized management and risk at the same time. It minimizes the number of decision makers. It minimizes overhead. It creates a very efficient system. It allows the party with the risk (the contractor) to make the decision. With minimized decision making and control, it is easy to identify who is responsible. It is the party at risk, the decision maker. These characteristics are characteristics of an information environment. A value based environment has the following characteristics (Lynch, Eder, Savicky, and Kashiwagi 2003):

1. Everyone knows who is responsible.
2. Everyone knows who can do the job and who cannot.
3. When someone fails, everyone knows.
4. No one makes decisions for anyone else because decision making brings risk.
5. Everyone is now motivated to self assess their performance, to continually improve, and add value.

An information environment has the same results as a leadership environment. Since the two are described using the same characteristics, the two are directly related. One of the problems in the construction industry is that we have far more managers than leaders. However, if a manager will use the process and refrain from making decisions, the results will be similar to that of a leader. The research therefore proposes that an information based process such as PIPS, can transform the results of a manager to that of a leader. The process will set the leadership environment even if the client representative is a manager.

These characteristics of leadership and an information based process also describe the process of outsourcing. Clients should not outsource and then manage the outsourced function. Without a method of identifying performance before the outsourcing, the

outsourcing function would have to be managed. If an outsourced function is being managed, it is very similar to a Quadrant I function, and will be price based and inefficient.

DIRECTION OF THE LEADERSHIP RESEARCH

The following has been presented:

1. The current price based environment has a management based structure.
2. Management structured processes are inefficient.
3. Leadership based structures are more efficient than management.
4. The performance based environment has a leadership structure.
5. Tests have validated the concept that higher performance can be obtained in the leadership structured performance based process.

Research at PBSRG, Arizona State University, is concentrating on finding ways to assist the construction industry move from the price based into a performance based environment. One of the methods is to introduce clients to PIPS and IMT. However, it has been difficult for client's representatives to sustain the new environment due to their tendency to use their management style to run PIPS. Another difficulty has been the reluctance of the construction industry to move to a performance based environment due to the need for performance measurements and differentiation. The industry has only been involved when the client has implemented PIPS, demanding that the contractors identify their performance and minimize risk. PBSRG has identified the following research projects to explore the possibility of making the performance based environment more understandable and sustainable:

1. Repackage PIPS and performance based procurement into a leadership based delivery process.
2. Create a graduate course in leadership for clients, showing the relationship between leadership and information concepts. The hypothesis is that the success of the course can be measured by the change in the participants understanding and ability to implement information concepts.
3. Create a graduate course on leadership for construction industry personnel, and measure the success of the curriculum also based on their ability to implement information concepts and assist in the education of PIPS, information concepts and leadership concepts to clients.
4. Move the education of PIPS to more universities in the United States.
5. Transform PIPS from a theoretical process to a well defined, rule based process.

The above research will become the dissertation topics for two PhD students and immediately tested at the General Dynamics Facility Management Research Institute and at Colorado State University to create a PBSRG satellite which will be contractor supported instead of client supported. In both dissertations the hypothesis will be that the leadership education will be able to accelerate the movement of both clients and contractors into a performance based environment.

CONCLUSION

Past research concludes that the practices of construction management (direction, control, and inspection) and the use of minimum standards may be inefficient and may actually allow nonperforming contractors to participate, becoming a source of risk. The implementation of management based solutions has not had a sustainable impact on the construction industry, and may not be an efficient solution. The management based thinking may even be resisting the movement into a performance based environment. The research also hypothesizes that leadership based solutions may be more successful. Leadership based solutions also include information based solutions where decision making, management, and external control are minimized. Based on ten years of research, testing these concepts in 380 tests on \$240M of construction procurement, preliminary results show an increase of 25% in performance (on time, on budget, customer satisfaction). The research concludes that construction management is a necessary component of a price based, commodity construction environment; however, it becomes an obstacle when attempting to improve efficiency or value, and when moving into a performance based construction environment which is built on performance, information and leadership based principles. Research is needed to identify if leadership based education (the opposite of management) can accelerate the implementation of a performance based delivery environment for construction.

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