

The Role of the Integrated Project Leader in the Architectural, Engineering, and Construction Industry

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The construction industry appears to be recovering from the effects of the recession of 2008 and is returning with a slightly different disposition. This change is perhaps most notable in contractual agreements, including those between clients and various disciplines, as well as contractual connections between the disciplines themselves. It is possible that a shift towards a greater balance of risk between the parties will emerge or perhaps new measures to mitigate risk will be adopted. This paper considers the development of a new role in the construction industry of an Integrated Project Leader (IPL) and the potential part that an IPL could play in the development, production, and successful outcome of projects in the construction industry. Data was gathered via a survey instrument that was completed by individuals in various positions in the design and construction industry. Results indicate varying perspectives on the role of IPL among respondents. Some primary predictors of the perspectives were the individual's role in the industry and the amount of experience that they had.

Keywords: integrated project leader, leadership, integrated project delivery, leader characteristics

Background

An economic recession which began in late 2008 dramatically impacted the construction industry in the United States (FRED, 2013). A report by the Research Division of the Federal Reserve Bank of St. Louis asserts that "construction and its interlinkages account for a large share of the actual changes in aggregate employment and gross domestic product during the expansion and the recession" (Boldrin, et. al., 2013, p. 1). Recognizing this link, the government invested several billions of dollars in projects to refurbish, improve and expand the aging infrastructure of the United States as well as an effort to rejuvenate lending for private and public construction (Goolsbee, 2011). While not fully recovered, the market has begun to regain some of its energy and new projects are restoring activity to the construction industry (Willamson, 2013). However, the reviving construction industry may be returning with a somewhat different disposition than before the recession that is still developing. This change is perhaps most notable in contractual agreements between clients and various disciplines and also among the disciplines themselves possibly in an attempt to shift towards a greater balance of risk among the parties.

This study investigates the emergence of the role of the Integrated Project Leader (IPL) in the construction industry and the potential role an IPL could play in the development, production, and successful outcome of design and construction projects. Previous research directly related to the role of IPL in the design and construction industry is limited. Various concepts related to leadership, integration, and construction were used in the development of the instrument for this study.

The purpose of this study was to analyze the perceptions that individuals from a variety of backgrounds involved in the Architectural, Engineering, and Construction (AEC) industry have of the role of an integrated project leader and the skills that should typify such a role. The objective was to develop a profile of a successful IPL. Data have been analyzed to identify preferences related to the types of skills and background desires in an integrated project leader.

Literature Review

Pauget and Wald (2013) studied the construction of a complex medical center. They sought to identify and classify critical roles within the network of teams involved in the design and construction process. The researchers classified the leadership on the project into three primary roles: coordinator, gate keeper, and mediator/translator. Each position served specific roles and required specific relational competency. The coordinator role was deemed the most centralized position and allowed for creation of rules and structure as well as the enforcement of them. Observations revealed this position as primary leadership over all other members of the team. The gate keeper role was noted as being positioned to oversee the connections between the network of teams and exterior resources. These individuals acted as an interface between in-network (project) and out-network (resources) processes, modifying the established systems and rules between the two. The mediator/translator, aware of existing values of various team segments, required the most intricate relational competencies of the three roles and facilitated adaptation between the groups as well as between the progressive phases of construction. The researchers concluded that these three types of competencies were necessary for the successful functioning, progression and completion of a project, particularly one of great complexity.

Another case study examined integration and leadership as enablers of innovation in construction (Ozorhon, et al., 2014). Researchers focused on identifying key instruments that drove innovation. Attention was focused specifically at the project level as opposed to innovations mandated from the executive level or by the design process. The study findings revealed the primary obstacles to innovation were: work force inexperience, resistance by contractor employees, and lack of availability to products. The role of trust between client and contractor was emphasized, along with good communication as imperative ingredients to successful implementation of new ideas. Leadership of the project contractor was specifically noted as critical to creating a culture of embracing innovation.

Rojas (2013) used a 360 assessment and focus groups with participants working at various levels in the hierarchy of unionized electrical construction contractors to focus on important characteristics of field supervision and project managers in that industry. Consistent themes were identified and researchers developed a list of 12 pillars of successful supervision. These pillars are: humility, character, leadership, consistency, commitment, curiosity, communication skills, people skills, effectiveness, knowledge, experience, and willingness. An assessment for each pillar was developed to be used for evaluating successful candidates for field supervisor and project manager roles in electrical contracting as well as other construction disciplines and electrical contracting. In a similar study, the leadership practices among construction professionals most highly valued by senior management were examined. The five most highly valued leadership practices include model the way, inspire a shared vision, challenge the process, enable others to act, and encourage the heart. Leadership practices that demonstrated expected behaviors for others to replicate, empowered others, and challenged the norms for improvements were noted as greater benefit than practices of emotional support or inspiring enthusiasm (Kouzes & Posner, 2007; Slattery & Sumner, 2011).

Emergence of the IPL

The Architectural, Engineering, and Construction (AEC) industry has evolved over time from skilled artisans and craftsperson to highly educated and individualized professions. The rejoining of these segmented professions has appeared in the form of teaming and delivery methods, most notably Design-Build (DB), Integrated Project Delivery (IPD), and by correlated association, Construction Management – Agent (CM-A). Each of these serve as an introductory step towards the merging of fragmented professionals and processes and the emerging of a new type of principal constructor team.

The method of joining professionals together by Design-Build (DB) is growing in popularity and use. The benefit of teaming architectural and construction professionals in one contractual agreement is that it creates a single entity which collaborates from the beginning of a project (DBIA, 2014). Sharing a combined financial agreement melds the objectives and purposes of the primary professionals in a manner that motivates them to work in tandem to produce a project. This empowers the various professions to combine individual expertise to solve issues. However, the DB team often is combined on a project by project basis and not as a fused entity offering combined services continually for every owner. This can create an ad hoc team that, while working together as a unit on a handful of projects, maintains an overall philosophy of a divided approach towards the practice of their role in the AEC industry. Additionally, the pairing is typically led by one “parent” discipline that brings the others in under their existing operation. The predominant trend is that a construction company employs an architect(s), full time or by

project basis, for the express purpose of providing design services (Zweig White Information Services, LLC., 2007). An inherent problem with a DB team structured thusly is that one discipline continues to drive the values for the team therefore the collaboration is rarely a true balanced amalgamation of the AEC professionals (Arditi and Günaydin, 1998).

The key to a balanced team can often be found in the leadership. A leader, or leadership group, that is balanced among disciplines can drive the values of the team in a holistic manner (Chiocchio et al., 2011). The principle of combining the primary professionals early in the process to deliver the best product requires refining and advancing. This idea is also present in the role of an IPL and is examined further in this paper.

An owner driven approach to combining the varied disciplines of the AEC industry is the Integrated Project Delivery (IPD) method. This technique joins the primary disciplines to the owner by a single contract where the team shares risk as well as the performance of a team (National Association of State Facilities, 2010). The team is awarded and/or penalized as one, based on the overall performance in delivering the project. This type of delivery method addresses a potential shortcoming of a DB team, which is weighted by individual role and performance, compared to an IPD structure that levels the responsibility and compensation requirements across team members (Lichtig, 2006). Like DB, the IPD contract introduces and engages all of the major participants at the onset of a project. IPD is especially well suited to exploit the technological tool of Building Information Modeling (BIM) which melds the professional participants together by process (Kent, 2010). While IPD is advantageous for owners in theory, there exist inherent problems with equalizing the rewards and risk of all team members. In reality, the effort and contribution of the disciplines, particularly the sub-consultants and sub-contractors are not always equal (Koutsikouri et al., 2008). Certainly, the individual disciplines are unlikely to view themselves as uniform in value of contribution and therefore it is questionable they will perform with the harmony, trust, and respect required for IPD to be executed as it is designed (Lau & Rowlinson, 2011).

Elevating key team members to equal roles is a plausible strategy for obtaining improved performance from a multi-disciplinary team. This practice is crucial for building relationships that value and leverage each member's expertise towards the end goal (Forgues & Koskela, 2009). The nature of the construction industry is to produce customized products for owners and facilitate the necessary emphasis of disciplines at appropriate times. In short, not every discipline is the "star" of every project every time and a team that is flexible and supportive will be a successful team. This element of IPD translates well to the concept of Integrated Project Leadership to guide the shifting importance of disciplines from project to projects, or even within one project through differing phases.

Defining IPL

Integrated Project Leader is a term somewhat new to the AEC industry and there is no industry consensus regarding its definition, which appears to be somewhat relative to individual perceptions. According to one definition, an IPL is "a title intended to clearly distinguish the primary accountability associated with leading a design-build team ... [that] may take the place of a traditional project manager in design-build, or the project manager may be subordinate to the Integrated Project Leader" (Jackson, 2012, p. 368). Additionally, IPL is "charged with supporting the team in its efforts to achieve an integrated, comprehensive solution that meets or exceeds the owner's expectations" (Jackson, 2012, p. 276). This definition posits that an IPL is related primarily to DB and other integrated projects. It is possible that an IPL could be added to projects of nearly any contractual delivery method and not limited to only those under the strict heading of design-build or integrated project delivery. For instance, projects of greater complexity, delivered by a traditional Design-Bid-Build method, could employ a skilled IPL to enhance the flow and success of a project.

For the purposes of this paper, IPL will be defined as an individual (or very small cohesive team of individuals) embedded in the process of producing a construction project, possessing knowledge, experience, and skills that promote the improved performance and processes of the design and construction efforts of a project. Much like the central cog of a wheel an IPL is positioned to interface with the critical members of any project and embodies industry expertise as well as management and people skills to enhance the overall experience and final product. The critical element of this role is leadership (Sumner & Slattery, 2010).

While an IPL is a type of project manager, it is a unique role from that of an architect or construction project manager. An architect project manager is primarily concerned with function for the end user and design aesthetics,

only taking cost and schedule into consideration as it limits design decisions. A construction project manager is primarily concerned with cost and schedule while design intent is not a priority unless it impacts the budget. An IPL concerns himself of herself with cost, schedule, function, and design. An IPL emphasizes a cohesive AEC team that performs well together to achieve the best project results and prioritizes that which is best for the end user.

Research Methodology

To gather data for this study, an 11-item survey instrument was designed to measure awareness and perceptions related to Integrated Project Leadership. This instrument assessed the values placed on centralized leadership, including what training, role, specific characteristics, and value it could provide to a design and construction project. Basic demographic information was collected from respondents that included area of formal education, years involved in the industry, and level of experience with various contract delivery methods. The online survey was sent to 479 individuals in the South-Central United States that are in various roles in the design and construction industry. Sixty-two responses were received, 17 from Architects, 14 from Engineers, 23 from General Contractor/Construction Managers, and eight from Sub-consultants. The final question of the survey was open-ended and asked “What skill sets do you believe are critical for an Integrated Project Leader to possess?” The roles and experience levels of the respondents are summarized in Figure 1.

Data were analyzed using SPSS to carry out an analysis of variance to compare means. The open-ended item responses were coded to generate a list of common responses. Missing data was minimal and only appeared in some small groupings. The data was replaced using regression imputation. The controlling variable for the regression imputation was the participant’s role in the industry. The full list of survey items is shown in Appendix A.

Results

Results of the survey revealed interesting opinions and perceptions of industry professionals about Integrated Project Leadership, as well as role and relevance of leadership. It is notable that respondents’ level of experience in the AEC industry was extensive, over two-thirds of study participants reported being in the profession for more than a decade. Fifty-five percent have been in their profession for over 20 years, 18% between 16 to 20 years, and 13% between 11 to 15 years. Only 14% of respondents had worked in the AEC industry for 10 years or less. The amount of experience and familiarity with various contract delivery methods was fairly even. The mean values between methods did not significantly differ, however Design-Bid-Build (DBB) was the most commonly reported delivery method and Integrated Project Delivery (IPD) was the least. There also was not a great difference of opinions between disciplines regarding the importance of communication. All the professionals highly valued interpersonal communication in the design and construction process. However, the majority of respondents agreed, regardless of discipline, that having a knowledgeable dispute moderator involved in a project from inception to completion would not prove to be a significant help in the project process. A summary of how participants responded to questions about characteristics of an IPL are shown in Figure 1.

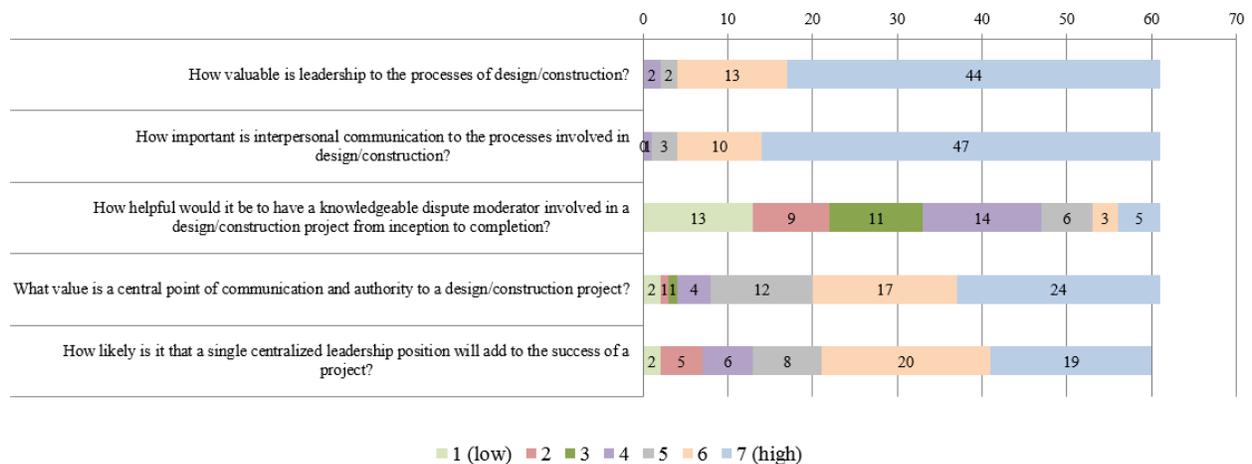


Figure 1: Valuable characteristics of an IPL

A distinct split was evident in how the disciplines valued leadership. Architects and General Contractors/Construction Managers highly valued leadership in the processes of design and construction. Engineers and Sub-Contractors, on the other hand, did not highly value it. A possible explanation for this distinction may be related to the traditional roles engineers and sub-contractors play and how they are contractually attached to teams. Engineers are often sub-consultants brought into the network of participants under an architect's prime agreement. Likewise, sub-contractors are generally grafted into projects through agreements with the prime contractor.

Another interesting dissimilarity emerged regarding a central point of communication and authority. Sub-contractors placed a somewhat higher value on having a central contact point than the other disciplines, which overall considered it of moderate importance. Additionally, general contractors/ project managers responded more strongly in favor of a single centralized leadership position for adding to the success of project than architects and engineers did. The latter group displayed much lower overall belief that it would increase the level of project success. This might be explained by the common practice in the region of having the prime contractor hold the contract with the project owner on integrated projects such as design-build.

Participants were fairly knowledgeable about the concept or role of an IPL, and were neutral or favorable in their impression of it. While there was one respondent that had a negative view of the concept of an IPL, stating that an IPL "is doomed to eventual failure" because it would be difficult to find a single leader that is discipline-neutral, many respondents indicated a favorable view of such a role. Most respondents stressed the importance of a leader that has "vision for ... [the] development [that would] push individuals out of their comfort zone." Others had similar thoughts and a common theme was summed up in one respondent's comment that an IPL must "be knowledgeable of the project ... [and] the challenges that each team member has in completing the project." The participants' impression of integrated project leadership is summarized in Figure 2.

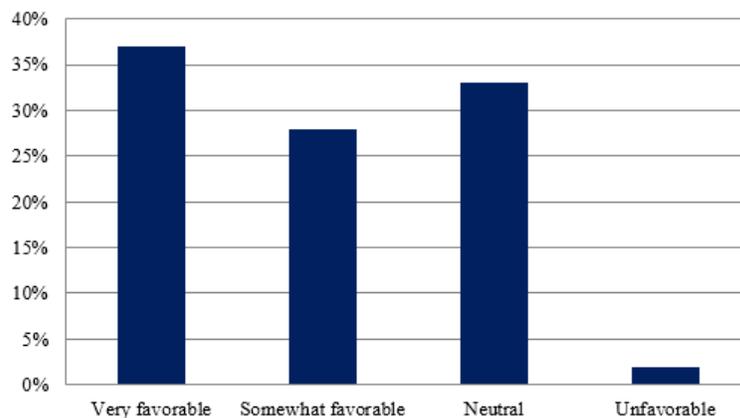


Figure 2: Impression of integrated project leadership

Nearly all respondents believed it is important to have a single individual in charge of an integrated design and construction team, which appears to contradict the concept of IPD as a flat team structure with equal authority and responsibility. Contractors were chosen by 60% of the respondents as the best suited team member for the project leadership role on a DB or other type of integrated project. The owner/developer was chosen by 14% of respondents and an even split of 9% each chose architect or engineer as the appropriate team member to lead a project. When asked to select what one area of training or expertise would be of most value for a centralized leader to possess, participants answered similarly with their own discipline, i.e., architects believed architectural training was the best, sub-contractors and contractors believed construction was best. However, engineers chose near evenly between engineering and construction training as the most beneficial. Overall, construction rose to the top as the overall most valuable training and/or experience for a centralized leader. Business/Finance training was the least chosen area.

The open-ended item sought the survey respondent's input for what skill sets are critical for an IPL to possess. After coding the data, 11 characteristics emerged as themes. These themes included: communication, leadership, cross-training, experience, organized, people skills, management skills, authority, business knowledge, mediator, and integrity. The top characteristic was cross-training with communication as a close second. Authority was mentioned third most, with leadership, people skills, and management skills cited an equal amount of times. The least noted

characteristic was integrity. The participants' responses regarding who they thought would be the best suited to lead the team and what their training should be in are summarized in Figure 3.

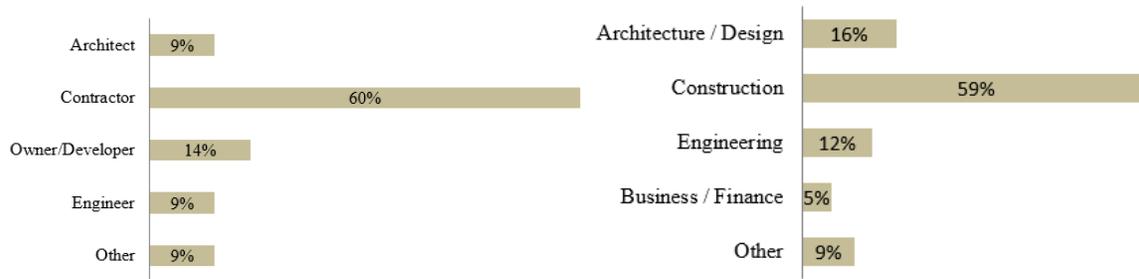


Figure 3: Team member and training best suited to lead an integrated project

Discussion

As the new role of an Integrated Project Leader emerges in the design and construction industry, the potential role an IPL could play in the development, production, and successful outcome of projects is being defined and recognized in the industry. Integrated project delivery is becoming more common in the construction industry as the value of collaboration among owners, designers, and constructors is being increasingly realized. This evolving process calls for individuals with specific skills to serve as Integrated Project Leaders on these projects. This study's findings provide insight regarding the skillset and background that is most desired for an individual serving as an integrated project leader. This step will contribute to the greater goal of facilitating IPL and fostering a culture of collaboration that will enhance project success.

The small sample size certainly was a limitation of the study. However, there were enough responses from a variety of participants to carry out meaningful analyses on the data. This ongoing study is seeking to gain a larger pool of respondent so that a more in-depth analysis can be done that can lead to larger scale generalizations.

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Appendix A: Survey Instrument

1. Which term most closely describes your role in the design/construction industry?
 - a. Architect
 - b. General Contractor/Construction manager
 - c. Owner/Developer
 - d. Engineer
 - e. Sub-Contractor
 - f. Other (please specify)
2. What area of study did you receive your formal education in?
 - a. Architecture
 - b. Business/Finance
 - c. Construction
 - d. Engineering
 - e. Other
 - f. No formal education

3. How many years have you worked in the industry?
 - a. 0-5 years
 - b. 6-10 years
 - c. 11-15 years
 - d. 16-20 years
 - e. Over 20 years
4. What type of contract delivery method do you have the most experience with? Please rate in order from least experience (1) to most experience (6).
 - a. Design-Bid-Build
 - b. Design-Build
 - c. Construction Management at Risk
 - d. Construction Management – Agency
 - e. Integrated Project Delivery
 - f. Other
5. Please rate each of the following according to a value on a scale of 1 to 7 with 1 being the lowest value and 7 being the highest.
 - a. How valuable is leadership to the processes of design/construction?
 - b. How important is interpersonal communication to the processes involved in design/construction?
 - c. How helpful would it be to have a knowledgeable dispute moderator involved in a design/construction project from inception to completion?
 - d. What value is a central point of communication and authority to a design/construction project?
 - e. How likely is it that a single centralized leadership position will add to the success of a project?
6. Which area of training/expertise is the MOST valuable for a centralized leader of a design/construction team to have?
 - a. Architecture/Design
 - b. Construction
 - c. Engineering
 - d. Business/Finance
 - e. Other
7. Which project team member would be best suited to be the project leader on a Design-Build or other type of integrated project?
 - a. Architect
 - b. Contractor
 - c. Owner/Developer
 - d. Engineer
 - e. Other (please specify)
8. How important do you believe it is to have a single individual in charge of an integrated design and construction project?
 - a. Extremely important
 - b. Very important
 - c. Neither important or unimportant
 - d. Very important
 - e. Not at all important
9. What is your level of knowledge of Integrated Project Leadership?
 - a. Very knowledgeable
 - b. Somewhat knowledgeable
 - c. Little knowledge
 - d. I've heard of the term but I have no knowledge about it
 - e. I've never heard of Integrated Project Leadership
10. What is your impression of Integrated Project Leadership?
 - a. Very favorable
 - b. Somewhat favorable
 - c. Neutral
 - d. Unfavorable
 - e. Very unfavorable
11. What skill sets do you believe are critical for an Integrated Project Leader to possess?