

Investigating Perceptions of the Architect's Role in Integrated Practices

“The architect should be equipped with knowledge of many branches of study and varied kinds of learning, for it is by his judgement that all work done by the other arts is put to test”

—Vitruvius, (trans. by Morgan)

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INTRODUCTION

In the past century, AEC project delivery methods have evolved in order to increase the value for owners and transfer financial and technical risks to the parties who are more competent to handle them (Miller et al., 2000). However, a recent study by Kent and Becerik-Gerber (2010) revealed that project delivery systems still suffer from communication inefficiencies, low productivity, and poor cost and schedule performance due to adversarial relationships across project teams. Improving this situation was the motivation for Integrated Project Delivery (IPD), a contractual paradigm shift that encourages project parties to change the nature of AEC relationships by sharing risks and rewards through integration and collaboration in design and construction processes (Duke et al., 2010; Cleves & Dal Gallo, 2012).

IPD has several characteristics that are recognized as drivers for change in the industry, especially in design practice. These include issues like collaboration processes, project leadership and management, means and methods of team communication, and risks and liabilities. However, no study has collectively examined the literature from these changing aspects of AEC integrated practice to see how IPD may change the roles, responsibilities, and participation of architects and design firms in project work.

To fill this gap, we review prior research to identify, extract, and report perceptions of integrated practices and their impact on architectural practice and compare these to IPD concepts and definitions. The main goal is to offer some important insights into often unnoticed and non-obvious changes in architects' roles and influence that have been occurring in integrated practices. These observations are significant because they offer a set of perspectives on IPD that can be shown to be different from what its working definitions have offered. This analysis will be conducted from the standpoints of architects' roles, responsibilities, and influence on the project processes, decision making, and its outcomes. In this way, it becomes evident how integrated project delivery methods might change design practice in the long run. This paper first gives a brief overview of IPD and general attitudes towards integration throughout the industry. Second, we compare the working definition of IPD and prior studies on industry participants' perception and experience of integrated practices.

BACKGROUND

GENERAL ATTITUDES TOWARDS INTEGRATED PRACTICES

Integrated Project Delivery is a project delivery approach that aims to improve project cost, schedule, and quality, through integration of people, systems, and business practices and elimination of adversarial relationships in collaborative work of all project participants (AIA California Council, 2007). The most recent definition of IPD from AIA California Council (2014) explains that, at a minimum, IPD contains several requirements, including (1) continuous involvement of key stakeholders and contracting parties in all project phases, (2) aligned business goals and shared risk and rewards, (3) collaborative project processing and control, (4) a multi-party agreement, and (5) liability waivers among key project parties. In many ways, IPD and integrated practices represent a profound shift from traditional delivery methods like design-bid-build. In IPD, major structures and processes of traditional AEC practice are modified and realigned: collaboration processes, project leadership and management, means and methods of team communication, and risks and liabilities among many others. For this current study, the most important shift is in the architect's role and responsibilities.

Architects are seen to be supportive of new integrated practice models but worry that team collaboration represents a loss of their authority and control. There is a consensus among professionals and scholars that collaborative methods usually improve AEC project performance and productivity (El Asmar et al., 2013, Baiden & Price, 2011). Among AEC project stakeholders, architects have the strongest belief that there are inefficiencies in the conventional project delivery methods which may be improved by better team collaboration (Kent & Becerik-Gerber, 2010). However, Puddicombe (1997) shows that architectural firms in the U.S. are less interested in integrated practice delivery methods like design-build because architects' control of project planning and design is thought to be reduced in comparison to traditional delivery methods. Volker and Klein (2010) demonstrate a similar situation in the Dutch construction industry where most design firms did not perceive any benefits for themselves in a shift to integrated practice models. In both of these studies, architectural design firms were more content to practice using conventional project delivery methods.

The novelty of concepts and contractual provisions in IPD is another one of the reason for suspicion among architects (Cleves & Dal Gallo, 2012). Hellmund, Van Den Wymelenberg, and Baker (2008) suggest that there are gaps in knowledge and understanding of IPD that include difficulties in determining new responsibilities, a lack of experience in new roles, and the problem of integrating communication styles across project teams. Despite these questions, NCARB (2013) reports that architects expect that the use of integrated practices will increase in the future, and this position is supported by surveys across all AEC project participants (Kent & Becerik-Gerber, 2010). These findings suggest that, while architects are concerned about a loss of project control and influence in IPD and therefore may be more comfortable with traditional delivery methods, they do recognize the problems of project collaboration and expect to see more IPD projects in the industry.

It appears that architects have multiple—and somewhat conflicting—views on the implementation of AEC integrated project delivery. They see the need for more collaborative project delivery processes and increasing reliance on IPD contracting, but also question how their roles are changed in terms of design and project management authority. These positions of architects have not necessarily been reflected in the definitions of IPD as its concepts have evolved through time. As this transition is ongoing, it is essential to look at the conceptual foundations of IPD, understand how these concepts are modifying architectural practices, and see how different project participants are perceiving shifts in the architect's roles, responsibilities, and influence in IPD that differ from conventional design practice.

LITERATURE REVIEW AND COMPARATIVE ANALYSIS

To enable this investigation, we analyze the working definition of IPD and compare its concepts to prior studies on AEC industry participants' perception of integrated practices. This analysis is conducted from the standpoints of the architect's roles and responsibilities, and their influence on the project processes, decision-making, and its outcomes. The objective is to explore the perceptions of change that AEC practitioners see happening to architectural practices, view these in comparison to the IPD working definitions, and assess whether or not IPD definitions have been able to reveal these underlying changes.

COLLABORATION WITHIN IPD DEFINITIONS

Currently, AEC industry participants agree that architects suffer from a knowledge gap of construction means and methods (Burr & Jones, 2010). Using IPD, collaboration between architects and builders can fill this knowledge gap in the design phase. Moreover, construction firms can provide the IPD team with more reliable information about constructability, market prices, market fluctuations, and other risks that can affect both design and construction processes and outcomes (Cleves & Dal Gallo, 2012). In IPD, different parties share their insight and experience early in the process. This can solve coordination issues before the fabrication and construction stages commence, and it reduces documentation time, and improves budget management and quality (AIA National & AIA California Council, 2007).

CONCERNS OF ARCHITECTS ABOUT COLLABORATION

In integrated delivery methods, architects face new situations where the architectural quality of a project might be affected. Architectural impact in this context refers to intangible and non-quantifiable criteria such as beauty and attractiveness which are essential qualities of an innovative ambitious design (Volker, 2010). In IPD, design solutions and alternatives are impacted by information provided by team collaborators, and this requires architects to trade-off between the architectural impact and construction productivity, means, and methods (Sebastian & Prins, 2009; Thomsen, 2009). Furthermore, as building assemblies become more complex, subcontractors, fabricators, and suppliers are increasingly required to design some building components by themselves. The role of architects in this new context shifts from designer to coordinator and manager. The so-called "demand side" of the AEC industry predicts this type of management role for architects, and suggests architects need more training in management skills (Jamieson et al., 2011).

Students and recent graduates in architecture believe that in the near future architects' influence on interdisciplinary processes will diminish unless architects improve their skills in engineering and construction processes. The term "architect" is viewed as a barrier between architecture and other design disciplines, and it ignores the "strong threat from engineers, whose technical abilities far outstripped the architect" (Jamieson et al., 2011: 17). Furthermore, as integrated practices are growing, architecture graduates are more willing to be part of multidisciplinary practices that enable them to work with different people from different disciplines and backgrounds, as old-fashioned architectural practices are not seen to satisfy their need for a more creative and dynamic work (Jamieson et al., 2011).

PROJECT LEADERSHIP ROLES WITHIN IPD DEFINITIONS

The concept of IPD does not generalize about who is the best party for leading an integrated AEC team. This role should be assigned on a project-by-project basis and to the "best person" after considering the competencies and characteristics of the participants and the project itself (AIA California Council, 2007). The updated working definition of IPD suggests that "leadership and decision making is both more inclusive and distributed" (AIA California Council, 2014: 16). This confirms that the "best person" in certain project phases and processes may be different from other phases and rotate across the collaborative team.

CONCERNS OF ARCHITECTS ABOUT PROJECT LEADERSHIP ROLES

Burr and Jones (2010) showed that the industry does not have a consensus on who should be in the leadership role in integrated practices such as design-build. Wamelink, Koolwijk, and van Doorn reported that in a design-build context, prime architects have perceived that “their influence on the quality of the end result had declined, and that the architect’s role had been reduced to that of a specialist in the design team” (2012: 1030). In a large survey of active U.S. architects, NCARB (2013) found that architects felt that they are no longer design leaders in integrated projects. Architects believe that they should be more active in changing this trend in future, and they have to revive their role as “master architects/master builders and assume the leadership role in all building projects, particularly in design decisions that would otherwise be made by contractors and engineers” (NCARB, 2013: 285).

Jamieson et al. (2011) surveyed global design firms and reported that the way public owners have acted towards outsourcing design and construction services is a source of risk for architects. They state that, in many projects, large construction firms act as the leaders of integrated project teams because of their ability to manage overall project risks. This change in the industry coincided with extra requirements and liabilities over BIM-driven design. Consequently, construction and engineering firms—who are in a better position to bear the risks—are the parties that make final decisions over design outcomes. This has impacted the influence of architects in integrated projects, forcing them to act purely as technicians who only coordinate and document design ideas developed by the contractors and subcontractors. Owners believe that architects have to accept that their role in mid-size and large projects will have to change with this evolution in project leadership (Jamieson et al., 2011). It may be that IPD practices encourage architects to be interdisciplinary leaders—as opposed to design leaders—with skills of collaboration and integration that are useful in the project delivery realm as well as in managerial roles: senior positions in construction and engineering firms as well as owner, developer, and policy making organizations.

COMMUNICATION WITHIN IPD DEFINITIONS

In traditional delivery methods, architects had the role of “gate-keeper” in communications between the owner and the contractor, often making the process slow, complex and inefficient. IPD relies on participant communication to such an extent that the co-location of the owner (or owner’s representative) and team members becomes a tremendous advantage; it facilitates performing daily work collaboratively through the continuous presence of best experts from each participating organization (Cleves & Dal Gallo, 2012; AIA California Council, 2014). Thompson and Ozbek (2012) reported that this configuration enhances the desire to communicate, increases the number of meetings, and decreases the planning and scheduling efforts for coordination, meeting, and collaboration.

CONCERNS OF ARCHITECTS ABOUT TEAM COMMUNICATION

Although co-location provides many advantages to IPD participants, Lehtinen (2013) has reported that co-location can be very distracting for designers as they need to focus on design problems and generate creative solutions. As Bilbo et al. (2015) observed, continuous co-location and too many lengthy meetings could result in “meeting exhaustion” for project team members. They added that, in their case study, too many IPD participants were involved which often slowed-down the process and made collaboration cumbersome (e.g. when the whole team had to deal with every minor problems subcontractors faced). However, for contractors and other members of the construction team, co-location can improve productivity as they can easily coordinate their work with designers.

Where virtual collaboration takes the place of co-location and other forms of face-to-face work environments in IPD, architects may find themselves working with team members located all across the globe. BIM technologies have changed the procurement strategy of design practices as they can outsource technical processes to skilled and trusted consultants in different countries (Jamieson et al., 2011). Given the costs of full-time co-location, virtual teams are gaining momentum and bringing distributed AEC teams from around the world together and enabling them to collaborate in a virtual setting (Thomsen, 2009).

| IPD WORKING DEFINITIONS | | ARCHITECT AND INDUSTRY PARTICIPANT PERCEPTIONS |
|---|---|---|
| Collaboration | <p>More reliable design solutions.</p> <p>More efficient design processes.</p> <p>Improved constructability and budget management.</p> | <p>Negative impact on architectural quality (Sebastian & Prins, 2009).</p> <p>Limited roles for architects in some design processes (Jamieson et al., 2011).</p> |
| Leadership Role | <p>Leadership assigned on the 'best person' basis.</p> | <p>Transition from designer-led practice to engineer-led practice (Jamieson et al., 2011).</p> <p>Architects would not be design leaders in integrated practices (NCARB, 2013)</p> <p>Architects would be the interdisciplinary leaders only for collaboration and coordination.</p> <p>Large construction firms act as the leaders because of their ability to manage overall project risks (Jamieson et al., 2011).</p> |
| Means and Methods of Communication | <p>Enhanced desire to communicate. Increased number of meetings.</p> <p>Decreased planning and scheduling efforts for coordination.</p> | <p>Co-location is very distracting for designers and reduces their productivity (Lehtinen, 2013).</p> <p>Meeting Exhaustion—Slowed down processing (Bilbo et al., 2015).</p> <p>IPD team size may make co-location infeasible.</p> <p>Designers prefer virtual collaboration instead of co-location (use resources in multiple projects) (Thomsen, 2009).</p> <p>Globalization and affordability issues of full-time co-location would increase virtual settings (Thomsen, 2009).</p> |
| Risks & Liability | <p>Reduced liability as all parties would take the responsibility for a whole project.</p> | <p>In future, liabilities of special trade design would be transferred to specialist subcontractors (Jamieson et al., 2011).</p> <p>Project participants would still be liable for their conventional responsibilities to the public law (Hatem, 2008).</p> <p>Sometimes project participants refuse to waive claims and liabilities (AIA, 2011).</p> |
| Architect's roles & responsibilities | <p>Various roles such as Integrated Project Coordinator (IPC), Prime Designer, and Design Consultant as well as BIM-related roles and responsibilities.</p> | <p>The most probable role for the architectural practice in future integrated practices would be the IPC role (Jamieson et al., 2011).</p> <p>BIM-related roles would restrict design creativity and they negatively impact the team's ability to generate alternative solutions (Sebastian, 2011; Dossick & Neff, 2014).</p> |

Table 1: Comparative Analysis of IPD Working Definitions and Perceptions

RISKS AND LIABILITIES WITHIN IPD DEFINITIONS

In traditional delivery methods, the architect is encouraged to provide the best possible design, while the contractor is encouraged to reduce project costs to increase the profit margin. The difference between these goals has always been a source of conflict. In IPD, these goals are integrated together to allow the project participants collaborate for the success of projects in terms of design quality, cost, and all other performance metrics. Therefore, in IPD the liabilities of the architect and the contractors are not limited to their contract with the owner and the conventional standard of care; they also have responsibilities to each other to resolve conflicts in a collaborative manner (Thomsen, 2009). The updated IPD working definition has interpreted this issue even more holistically, saying that liabilities are reduced because the AEC team collectively takes the responsibility for a whole project (AIA California Council, 2014).

CONCERNS OF ARCHITECTS ABOUT RISKS AND LIABILITIES

From the legal perspective, Hatem (2008) asserts that the existing standard forms of IPD agreements have not clearly dealt with design liabilities in IPD projects. He states that “collaborative or shared design does not necessarily equate with shared design responsibility” as the public law has its own interpretation of design responsibility. Architects still have legal responsibility for care; “Contractual forms of agreement and contractual decisions regarding risk allocation simply cannot be made in a vacuum given the strong public interest in protecting public health, safety, and welfare” (Hatem, 2008: 14).

From the collaboration and integration standpoint, as new building technologies have been introduced into the industry, liabilities of specialty trade design and detailing would generally be transferred to specialist subcontractors. In this system, an architect would act as coordinator and facilitator who integrates components designed by different project parties (Jamieson et al., 2011).

Although IPD provisions may waive claims and liability between the contracting parties, project participants would be liable for their conventional responsibilities as found in public law. This includes the responsibility for design: “A licensed architect or engineer must be the designer of record under state licensing laws” (Andre, 2011: 5). As the liability waiver is a huge step for all key contracting parties, sometimes project participants may refuse to waive claims and liabilities (examples reported in AIA 2011: 22).

ARCHITECT’S ROLES AND RESPONSIBILITIES WITHIN IPD DEFINITIONS

A design firm may have different roles in an IPD configuration, including integrated project coordinator (IPC), prime designer, and design consultant. An IPC has the responsibility of “overall facilitation, coordination, organization and direction of the integrated team, team’s compliance with owner’s requirements, overall project schedule, and completeness of necessary project information” (AIA National & AIA California Council, 2007: 23-24) A prime designer has the responsibility for overall design and design integration, while a design consultant has a focus on a specific building system (e.g. façade). Moreover, there is a consultancy role for IPD implementation from the concept and team member selection through the project handover. Anyone inside (e.g. architect, contractor) as well as outside (e.g. attorneys) may be appointed as the IPD consultant based on their experience in such a role (Cleves & Dal Gallo, 2012). Incorporating digital design and construction technologies to the integrated project delivery system is crucial: “For projects requiring high levels of integration, technology like Building Information Modeling (BIM), cloud servers, teleconference tools, and others become crucial to making it all work” (AIA California Council, 2014: 6). As a result of these requirements, new roles such as BIM manager, BIM operator, BIM facilitator, document

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controllers, 3D modelers, and BIM technicians have been introduced into the industry to integrate and manage design and construction outcomes (Kymmell, 2008; Whyte, 2011).

CONCERNS OF ARCHITECTS ABOUT ROLES AND RESPONSIBILITIES

BIM implementation and BIM-related roles have raised some concerns among architects who believe that highly detailed BIM models would restrict design creativity (Sebastian, 2011). Dossick and Neff (2014) found that using BIM models in design and problem solving processes can negatively impact the integrated team's ability to generate alternative solutions. The increasing importance of BIM also reinforces the previously discussed effect of shifting architectural leadership; as the role and responsibility of architects in IPD shifts from design to leadership of team collaboration and integration, the architect's influence on design would diminish in collaborative efforts with leading contractors. BIM has become central to the workflows and efficiencies of specialty trade designers and subcontractors. Consequently, one of the most probable roles for future IPD architects will be the IPC role.

As architects have skills to think strategically, they can provide many services as design coordinators and managers in different creative processes, master planners, pre-project analysts, consultants, and senior managers. Jamieson predicts that the term "architect" will not be used that often in the future, as the role of conventional architects would significantly change, except for sole practitioners and small firms which "will remain fairly unscathed over the next fifteen years" because they would work either as in-house teams to manage design development stages or as small occasional service providers (Jamieson et al., 2011: 29).

DISCUSSION AND CONCLUSION

This study set out with the aim of comparing IPD working definitions with documented research on AEC industry participants' perceptions of the roles and influence of architects in integrated practices. This is significant because this paper reports on a set of perspectives on IPD that is relatively different from what the working definitions offer, and no previous research has attempted to review, identify, and combine these perspectives. A summary of this comparative analysis is presented in Table 1, which shows that concerns of architects about IPD and industry participants' perceptions of integrated practices have not been adequately addressed in IPD concepts and working definitions. As delineated in the earlier thematic discussion, it can be seen that the architect's roles, responsibilities, and influence on design processes and outcomes would change in integrated practices, especially in terms of design leadership, design decision making, and contractual transactions. Furthermore, the architectural and aesthetic quality of design could be impacted as a result of new technologies and interdisciplinary involvement of project participants early in the design processes.

Although much research has reported the positive aspects of IPD in terms of cost and schedule performance, many negative perceptions are also attributed to this project delivery method from the perspectives of architects. For this reason, as Bilbo et al. (2015: 52) assert, IPD is not challenge free and is not "the last word" in project delivery methods.

This conceptual comparison also has important implications for architectural practice because these changes include embedded limitations and opportunities. As integrated project teams are comprised of people with unique expertise to deal with the increasing complexities of building design and construction, the most significant risk for architects is the probable reduction in the range of involvement, roles, and services that they are able to offer. As we have seen, the literature shows that architects are sensing this reality.

In order to retain a leadership role, architects could enlarge their knowledge and skills in wider fields of communication, technology, collaboration, project facilitation and management, and constructability—a position NCARB (2013) advocates. This ability would also

provide the opportunity to market much broader problem-solving services rather than focusing just on conventional building design. This reflects the prospect of “general consultancy,” which opens “a broader spectrum of opportunities” for architects to work in other problem-solving and design disciplines (Jamieson et al., 2011: 32-33).

This study illuminates the continuing challenges to the thought leaders and industry organizations that are doing the valuable work of building the concepts and practices of Integrated Project Delivery. Where the earliest years of IPD saw the necessity of innovation and advocacy, the research literature collected in this study shows that the outcomes of IPD in terms of the concerns of architects and industry participants’ perceptions deserve to be addressed by how integrated practices are defined, promoted, and advanced through the AEC industry. The next generation of IPD concepts should be informed by the parallel evolution of the AEC disciplines and their historic practices that are being challenged by Integrated Project Delivery.

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