RE-NEGOTIATING ARCHITECTS' RELEVANCY – A U.S. PERSPECTIVE ON IPD AND BIM

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Abstract
The building industry is currently exploring two primary strategies to combat inefficiency: Integrated Project Delivery (IPD) and Building Information Modeling (BIM). Both strategies attempt to create a communication network that overcomes the inefficiencies of the fragmented design and construction process. The architect's role in both strategies remains largely undefined. Future negotiations will define who will lead these networks and subsequently the building industry. Industry roles are analyzed through business negotiation constructs and tools, contractual relationships, literature reviews and primary interviews representing the full building industry. The method highlights ways in which the architecture profession has become marginalized based on its own contractual, legal, and economic motives as well as those of the other parties. It clearly demonstrates why IPD and BIM will only perpetuate and reinforce the current marginal role of the U.S. architect unless they are used to change business relationships. Architects must develop new contractual agreements that reflect IPD and BIM as business strategies rather than using them as mere tools to execute the same contractual relationships. IPD and BIM present architects with an opportunity to use new technology to redefine their value and relevance to the industry.

Keywords- Integrated Project Delivery (IPD), Building Information Modeling (BIM), Project Delivery, Architect's Role, Negotiation

INTRODUCTION: REDEFINING ARCHITECTURE'S RELEVANCY IN AN INEFFICIENT INDUSTRY

"A US Bureau of Labor Statistics study shows construction alone, out of all non-farm industries, as decreasing in productivity since 1964, while all other non-farm industries have increased productivity by over 200% during the same period." (AIA,1:3)

This surprising statistic demands a re-examination of professional roles in the building industry since it is often suggested that the inefficiency is a result of a structured adversarial relationship between the multiple parties: owners, architects, engineers, construction managers, contractors, sub contractors, fabricators, and so on. Two strategies for creating a more efficient, less adversarial profession are currently gaining traction; Integrated Project Delivery (IPD) and Building Information Modeling (BIM) software. IPD and BIM are two strategies to create a more communicative network of professionals. Both strategies attempt to create a communication network that overcomes the inefficiencies of the fragmented design and construction process. Future negotiations will define who will lead these networks and subsequently the building industry. This fundamental negotiation, brought about by the advent of IPD and BIM will redefine the building industry landscape and inevitably determine the future role of architects and their relevancy to the final product.

Integrated Project Delivery (IPD) is a strategy that creates a building professionals' team from the outset of the project. The concept is to bring all major parties on board from conception of the project in order to realize the value that their expertise can have on a project.

> "Integrated Project Delivery (IPD) is a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction." (AIA IPD Guide p 2)

A typical example is that rather than having an architect do initial cost estimating for the client, in an IPD project the contractor is already under contract with the owner and therefore assists the architect in cost estimating since it is their area of expertise.

Building Information Modeling (BIM) is a business tool heralded as a solution to the inefficiencies and adversarial relationships in the industry. BIM is "an object-oriented building development tool that utilizes 5-D [x, y, and z coordinates, project scheduling, and cost estimating] modeling concepts, information technology and software interoperability to design, construct and operate a building project, as well as communicate its details." (www.bimforum.org) Developed in the late 1980s, a number of different software companies have developed rival models. Most BIM software (like the industry leader, Revit) is a design tool that assists with 3-D drafting and then requires additional and separate software programs for

project scheduling and cost estimating. This paper will use the term BIM to refer to the complete 5-D software package.

THE ARCHITECT'S ROLE: HISTORICAL MODELS

An industry paradigm shift is taking place. The most popular current business model, design-bid-build (DBB) is not only broken, it is a model that is inherently limited in its ability to deliver projects efficiently. DBB defines the form and process of the contractual agreement between the owner, prime professional and contractors. For the purpose of this paper the term 'business model' will refer to the form of the contractual agreement between the owner, prime professional, other professionals and the contractor. Other examples of business models discussed in this paper are 'guilded-age', CM-GC at Risk, Design-Build, and Single Project Entities.

The current industrial landscape and DBB business model in the United States has its roots in federal government legislation enacted in the 1970s. In response to antitrust legislation and lawsuits, the American Institute of Architects in 1977 revised the Professional Code of Ethics and Professional Conduct making it possible for architects to "participate in profit or loss situations related to labor and materials in construction contracting" (Agostini) Although the ruling increases the roles a professional architect can take, it also had the adverse affect of making the profession much more risk adverse due to the potential higher exposure of liability because construction contracting is not protected by professional liability insurance. Prior to this fundamental ruling, the "guilded age" business model of U.S. architecture reigned. Architects were the natural leaders of the industry because they were protected by professional liability insurance for all of their potential (although limited) roles. With the adoption of the new Professional Code of Ethics and Professional Conduct architects were forced to develop contractual clauses that insulated themselves from performance tasks that did not fall under their professional liability coverage. (Agostini) Therefore, architects since 1977 have sought to maintain a similar level of control but from a position of less legal vulnerability. They sell advice, while other parties prescribe "means and methods".

The result is that roles have been defined and assigned primarily on the basis of risk management and subsequently risk management has defined the DBB business model, which is role based. A profession's risk management policy is a necessary parameter but it should not be the basis of a business model. The foundation of an industry's business model is normally based on recognizing an economic opportunity; the needs of clients. (Dorf, 28) In the building industry's case it should be based on delivering projects that meet the budget, schedule and quality parameters that the client has established.

The Design-Bid-Build business model may best described as role-based or in negotiation terms, position-based. Each role in the building project is assigned to a specific profession. In order to complete each task, a separate contract is written. This is a distributive process. For every task done by one party, the other party does not need to do it. When disputes arise over who is responsible for a task the contract is consulted and a distributive ruling is made; one party wins,

one party loses. These rulings are based on the contractual agreement which are typically based on standard documents that assign liabilities based on what role the profession has in the industry. The profession of architecture has been contractually assigned to certain positions, which obligate each practicing architect to fulfill a specific role in a project, and similarly for the other professions.

This has presented the industry with a particular problem that has led to extreme inefficiencies; *the business model does not expressly ensure that those taking risk are involved in the decision-making process related to that risk.* The problem manifests because architects are legally only contracted to supply advice, or suggestions for how a building may be executed. Architects are instructed, due to risk management, to never advise means or methods. "…the contractor (directly or through others) is responsible for the design and implementation of the construction, methods, procedures, sequences, and techniques…" (Hess, 94) This is a double-edged sword for architects (and consequently the industry) because a particular detail matters to the design and designing the particular detail is the fulfillment of the architect's contract to the owner, but architects are not able to control the implementation of the detail. The implementation of the detail affects the budget, schedule, and future liability, which are contractually obligated to the contractor, but the contractor is not able to influence the initial design. The responsibility of the budget, schedule, and future liability have a much higher risk because of associated potential financial penalties than design. (Hess, 305) Yet, in the Design-Bid-Build business model, the architect is the owner's agent, performing initial cost estimates, advising on schedule, and providing construction administration. It is quite easy to see how this model can turn into an adversarial relationship where blame keeps getting passed around.

In response to the failings of the Design-Bid-Build business model to associate the responsible party with associated risk, General Contractors (GC) and Construction Managers (CM) introduced a different business model, "CM-GC at Risk", as an attempt to make the prime professional the professional who is at risk for managing the schedule, cost and quality. In a "CM-GC at Risk" business model owners will first hire a firm to perform owner representation responsibilities before they will hire an architect, making the CM the prime professional. It was a natural evolution for the "CM-GC at Risk" model to evolve because of the risks and responsibilities that GCs and CMs take on in a project. The leader of the industry should be someone who has the ability to coordinate and negotiate with the other members in a way that brings the most value to the owner. With this model the owner gets a single entity it can hold responsible and look to for all stages of the project.

As the profession of Construction Management has grown to fill the void of project management, the architect's relevancy to the building profession has been marginalized because their value to the owner has diminished. "Modern day variations on the traditional construction process emerged in the early 1970's with the advent of the construction management industry. This industry emerged as a result of the search by owner/developers for ways to reduce costs. The construction manager offered the developer potential savings from the efficiencies it would extract from the cost of design and the time of construction. These savings were to result from the construction manager's performance of various activities on behalf of the project, including scheduling, coordinating, inspecting, and expediting cash flow-responsibilities increasingly abandoned by architects and engineers." (Agostini) Because architects had reduced their role to

advice about design, cutting out all responsibility for the means of accomplishing it, they were unable to meet owners' needs on two out of the three matters that Garth Brandaw, Principal at CB|2 Architects and Construction, says owners care about; "schedule, cost, and quality". By limiting their role in how a building is constructed architects have allowed others to expand their decision making over the design process. "The notion of having management services provided by an entity independent of the architect and contractor appears to arise from the architect's withdrawal from its former role as master builder and, more recently, the cost of financing complex projects, unpredictable labor demands, and rapidly developing technology." (Hess, 248) The last 30 years of the Design-Bid-Build business model has had significant consequences; it led to the adversarial relationships and industry inefficiencies described above and it has led to the 'elephant in the room' question for architects, How are architects relevant?

DEFINING THE CURRENT AND FUTURE ROLE OF THE ARCHITECT

As much as the architecture profession does not want to ask this question, it is vital to understanding how the negotiations over leadership in the IPD and BIM strategies will unfold and consequently the landscape of the building industry.

Thus far we have discussed changes that have taken place in the industry that have removed responsibility from the architect and have thus marginalized them. It is incumbent to also ask what *is* expected of an architect. What do architects do? This is a surprisingly difficult task considering the long history and respectable position architects hold. It is confounded by the profession having historical foundations in art, engineering, and craft. The fact that it is so complicated to try and define a modern architect, is perhaps, the most insightful fact in trying to answer how architects are relevant. Architects for a long time have not engineered buildings, that is its own separate profession. Nor are they craftsmen anymore, at least on medium and large scale projects. That leaves art, or design as the remaining role. Contemporary design of buildings has two components, the design, and the management of the design. In the "guilded age" of architecture these two components were inseparable. Today, they are distinct in large part because of risk management and the ramifications of the Design-Bid-Build business model previously evidenced.

Both components of the architecture profession, design and project management are under intense competition. The project management component is challenged by construction managers, general contractors offering project management services, risk management policies, architect's own lack of training in management and by architects not being able to clearly articulate the added value of architectural based project management. The design component is being challenged by the cost of design, and by architects not being able to clearly articulate how design adds value to a project.

It is self evident that those variables will impact the ability of architects to realize their designs. What has not been self evident to architects is that *the relevancy of their design work is contingent on the relevancy of their management work.* The architecture profession is charged with translating the vision of the owner into reality. This requires both design and management

strategies and tools. Architects and architectural education have eschewed developing skills in management to serve the owner, and thus their product, design, has become less and less relevant. The profession leading the industry will continue to be the profession that offers the most value to the owner.

Architects can return to being the leaders of the industry because they are the representatives of the owner's vision and have the clearest view of what the end product will be that satisfies the original intent- if they are willing to learn enough about the other tasks to add value for the owners by being able to manage the integration and willing to take the economic responsibility (risk) of being the leader. Without adding these skills that provide the owner with the primary value they are seeking, delivery of the project, the U.S. architect will have the product of design more and more dictated by those who do add the value of management.

IPD AND BIM AS TOOLS

The advent of IPD and BIM present an opportunity for architects to renegotiate their relevancy by addressing their role as managers. IPD is a new business strategy that can increase architects relevance as managers and their design's relevance to clients. BIM is a tool to facilitate both of these. Using new strategies and new tools will ultimately push the industry to arrive at a more efficient business model.

Because of the inefficiencies previously discussed, the industry must move from role based project delivery strategies to an integrated project delivery strategy and architects have a tremendous amount to gain by this shift in strategy. An efficient delivery method should be one where each team member can use it's strength to create greater value for the project, which can then be shared amongst the team. For any team to be successful strong leadership is essential. This means that there must be designated, by agreement, somebody in the middle of the network to guide the network. The role of a leader is to be integrative. It is not simply enough to have a network and expect it to solve the problems. This is what continues to be missing from both the IPD and BIM strategies. John Baker of Jordan Schrader Attorneys at Law makes the point simply, "It doesn't matter what the model is, it matters who is leading."

Leadership in the building profession is difficult because of the nature of the industry. Teamwork is perfected through practice, learning from mistakes, and from getting to know the strengths and weaknesses of your teammates. That repetition and learning does not happen in the building industry.

> "In industries such as manufacturing, finance, sales and research, teams often spend years and sometimes entire careers working together building trust, eliminating the fear of conflict, and establishing team commitment and buy-in. This is essential to develop individual and group accountability for the team's work results and for the success of the team's mission. Design and construction teams, on the other hand, are often ad hoc, leaving little time to develop and build upon the types of relationships that result in strong, synergistic teams that produce

> sustained great results… Of the 150,000+ commercial buildings constructed in the United States each year, it is rare when two projects share the same architect, owner, contractor, subcontractors, manufacturers, suppliers, users, operators, and maintenance firms, much less the identical individuals and personalities within those firms." (Knight, 74)

The IPD strategy and BIM tool represent the creation of a real (IPD) and a virtual (BIM) communication network. They are often spoken of in tandem because of the team collaboration needed to be successful with either model. "The goal of everyone in the industry should be better, faster, more capable project delivery created by fully integrated, collaborative teams...It is increasingly believed that the achievement of this elusive goal, commonly called 'integrated project delivery' (IPD), will be facilitated by the emerging technology of building information modeling (BIM)." (Nobel, 65)

While sharing similar goals, IPD and BIM require very different forms of collaboration. BIM facilitates a tangible transfer of expertise through technical data. IPD facilitates a transfer of intangible expertise. Using IPD in tandem with BIM will enhance both the relevancy of BIM and the likelihood of success, but is not a necessity. Thus far the adoption of IPD and BIM into the industry have followed separate tracks. In fact, many firms adopt BIM with the expectation that it will takes the place of IPD or automatically make IPD happen. The reasoning is that BIM will provide the platform to increase collaboration and therefore the project will be 'integrated'. However, the current trend represented in the new AIA contracts for BIM projects is to define points where the model can be passed off to the next profession, rather than to have multiple professions work on it simultaneously. This is the continuation of the same model of role based project delivery but with a new tool.

This use of BIM reinforces the trend of further commoditization of design as a product, separate from management and this will not restore architect's relevancy. Corey Griffin, Associate Professor at the University of Oregon, explains that the AIA views BIM as a way to make architects relevant again but in a self-limiting capacity. BIM creates the ability for architects to create a new revenue stream, the selling of a digital model that will continue to be relevant and useful to the owner after construction is complete. The hypothesis is that if architects begin actually selling a product and not just advice it creates the ability for architects to reframe their value to owners and renegotiate for a more powerful position. Similarly, BIM also allows architects to sell a product to contractors. Architects would have the ability to sell material take offs, or the model itself. Currently the architect "sells" the plans to the owner and the owner gives them to the contractor to build the building. This would be a renegotiation of the relationship between architects and contractors, which would try to create additional roles for architects and therefore make them less expendable.

Building the model has created additional value for the project team but the act of selling the model to the owners, or the contractor, however, has just redistributed the same value to new players. This is not a particularly strong negotiation position because other parties will be reluctant to give up their value with little in return. While architects are trying to redistribute more value to themselves, so too are contractors. While based on 3-d drafting, the power of BIM is its ability to assist with scheduling and cost estimating which is why contractors have

embraced BIM faster than architects. This means that contractors can strengthen their value offered to owners. Their position is that with BIM they can provide more accurate and more cost effective ways to manage budgeting and scheduling. The key difference is that contractors are negotiating with owners over BIM as a management tool to improve their service and architects are negotiating with owners over BIM as a product that owners can purchase. Additionally, BIM as an architectural product would further perpetuate the trend of separating the product of design and the service of design management. Thus perpetuating the subordination and irrelevance of architects.

Yet, the architect's interest in selling a product is an understandable position when one only looks at the proposition of using BIM. Somebody has to pay for the upfront cost of developing the BIM model, but the value is not realized until the construction phase. In a purely role defined strategy it necessitates the architect spending more time and money on design and the contractor receiving most of the benefits; thus the push to turn BIM into a saleable product. These problems have been already noted in the industry: "If the BIM generated data is not entirely accurate for its purpose, the result could be disastrous. Oftentimes these models will be labeled 'for reference only' or with some other disclaimer of accuracy, because designers are not willing to assume the risk associated with warranting their use. Obviously, the more disclaimers, the less likely people will be to use the technology. Furthermore, designers have not necessarily received additional compensation for the efficiency and savings created when the BIM technology is used. Therefore, they have less motivation to utilize the system to its full potential." (ENR, 2008, 16)

But using BIM as a product is a shortsighted solution. It is shortsighted because owners are most interested in efficient management of their project. Architects should be developing the ability to prove they can be effective managers of the budget, Mr. Bradshaw says, so that they can be in a position to lead the project.

ALTERNATE MODELS

The solution begins with IPD strategies followed by developing new business models. If there is an integrative approach to the negotiations rather than a distributive approach, as the name integrated project delivery suggests, it would matter less who is performing the task and matter more that additional value is being created. While all parties recognize that additional value can be created through IPD and BIM, all parties are skeptical that it will trickle back to them. Couple that with the history of the industry and there is a lack of trust to work through the hard negotiations of figuring out how to structure agreements. Therefore what is evident is great discourse on the subject from both sides, but limited follow through.

Two business models, which are developing and rooted in IPD strategy, are Single Project Entities and Design-Build. Design-Build firms have been around for a long time and are based on the guild-tradition of a master builder and implicitly contain project management services. Complete Design-Build firms (architects, managers, carpenters) are more typical of residential construction and small-scale projects. However, the idea of what the model represents, a firm that is responsible for the entire project, is transferable to the entire industry. On larger projects it

may be more appropriate to call these Design-Management firms rather than Design-Build. This business model is occurring in an incremental process as both architecture firms and contractors are embracing IPD strategies and are bringing more services in house. Contractors are hiring architects and developing divisions to either perform architecture services or to assist other architecture firms with constructability assessments. More slowly, architecture firms are redefining and expanding their scope of services to include development, cost estimating, project management, and construction. Walsh Construction in Portland, OR has a detail division with staff architects to help the architecture firms it contracts with perform enclosure and constructability detail reviews. Andrew Beyer the VP of Walsh Co. views the detail group at Walsh as a proactive step towards a long term goal of IPD. BIM is an excellent business tool for facilitating this collaboration and the real value of BIM as an integration and efficiency tool can be realized when it is not passed between firms and used for individual benefits but rather shared and used for the benefit of the project.

Single Project Entities (SPE) is another business model that can facilitate IPD. A SPE is a legal entity that forms for the sole purpose of one project. The architect, contractor, construction manager, and possibly other parties form a legal entity, typically a Limited Liability Corporation (LLC), to be hired by the owner to perform all the services necessary to complete the project. This is the ultimate IPD, a legal entity that is made up of all the separate professions with the shared common goal of trying to be as profitable as they can be, as a team, so that they can all benefit. Additionally, because they are one legal entity, they cannot sue each other over any disputes. This creates an immediate solution to the lack of trust in the industry and incentivizes collaboration because the profits of the LLC are distributed amongst the team in a preset formula. SPEs are extremely rare but offer a novel approach to overcome the adversarial and inefficient norm.

CONCLUSIONS: THE ROLE OF NEW TOOLS VERSUS THE NEED FOR NEW BUSINESS MODELS

Single Project Entity, Design-Build business models, Integrated Project Delivery strategies and Building Information Modeling tools all attempt to establish a better network of communication. However, no model, strategy, or tool dictates who will be leading that network. The negotiations that will happen over those issues will define the landscape of the next era in the building industry. Architects will seek to regain their relevancy and contractors will seek to improve on their efficiency. Those two goals are not mutually exclusive and therein lies the potential for both IPD and BIM to be adopted and for a less adversarial industry to develop.

In order to capitalize on this opportunity architects must develop their design management skills in tandem with their design skills so that the product of design is not separable from the service of the management of design. This necessitates management skills and a vocabulary, which are not typically incorporated into the architect's education. Currently, architects have the skills to invest in BIM and therefore must embrace BIM as a fulcrum to re-negotiate their relevancy by adding value to the project for the owner. However, that is only a first step. Architects must follow by using that value to play a leadership role in IPD strategies. Yet, architects will only be

relevant in a central leadership role if they re-engage in the construction process, which will necessitate a new risk management policy and new business models. Architects must increase their efficiency and their value-added necessity, not simply cost-added luxury, to owners, otherwise architects will continue to see their influence on the built environment decline.

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