History, Current Practices, and Implications for the Future: The Role of the Architect

Kevin L. Burr, Ed.D, and Chad B. Jones, M.S.
Brigham Young University
Provo, UT

For centuries the master builder, the one who was responsible for both the design and the construction of a project, had sufficient design and construction expertise to oversee a project from inception to completion. Eventually, increased complexity required a higher level of specialization, leading to the separation of the designer and the builder. Since that separation, the role of the designer or architect has continued to shift and evolve. The *exact* role of the architect today is unclear. However, in integrating design and building team efforts the entire construction industry continues to grow and provide new opportunities for advancement. The successful architect of the future could be one who strives to reclaim lost responsibilities, explores new alternative services, and promotes a higher level of collaboration with the build team.

Key word: Architect, General Contractor (GC), Construction Manager (CM), Design-Bid-Build (DBB), Design-Build (DB), Construction Manager at Risk, Master Builder

Introduction and Background to the Problem

For centuries the architect was the keystone of every large construction project. The architect, throughout history, has been a *master builder* who held responsibility for both the design and the construction of a building. In fact, the term architect was derived from Ancient Greece where Arkhi meant head chief or master and tekton meant worker or builder (Berman, 2003). Today, however, the role of the architect has evolved into a profession that differs from the historical definition.

During the nineteenth century, construction projects began to grow in complexity and scale. Growth led to new technology and techniques. New technology and techniques then led to specialization. As a result, the apprentice-trained master builder began to lose his expertise in all the building disciplines. This was when the master builder separated into two distinct professionals: the designer and the builder (Thomsen, 2002).

Soon after the initial separation the architect and the builder, began to go through the process of creating new relationships with sub-contractors. Consultants to the architect began to assume the responsibility of various areas of design specialization such as electrical design, mechanical and plumbing design, and structural integrity. Today, the architect engages additional architects as specialized consultants, such as landscape, interior, acoustical, and laboratory designers (Woods, 1999). Fragmentation has eliminated a single source of responsibility and hindered collaboration due to the growing number of professionals involved in the process. To counteract, the construction industry has been exploring alternative delivery methods and the introduction of new professionals such as the construction manager.

The profession of the architect is in a new infancy, trying to find its place in a continuously evolving construction process. Although there have been attempts that have resolved some concerns, they have also introduced new problems such as confusion of definitions and conflicts of roles. What is the position of the architect in the construction process today and what will be the role of the architect in the future?

A Basic Return to the Master Builder

There is a new trend in the industry that could perhaps be considered as a shift back to the master builder concept. Fast-track and turn-key projects require the integration of many disciplines. On smaller projects, owners often do not have the management skills or staff to separate out the design, engineering, consulting, procuring, and construction contracts. Clients are looking for firms who can provide an all-inclusive service (Taylor, 2000).

According to Christopher Widener, FAIA (2000), "There is a growing trend for the architect to become the lead on design-build projects." As the lead in a design-build contract, the designer (architect) coordinates the project, including the construction, in one of two ways: either as a construction manager for fee or a construction manager at risk. Basically, the role of the general contractor is either eliminated or reduced to a limited role. In the case of a CM for fee negotiation, the owner must clearly understand that they assume all responsibility for cost overruns, change orders, and late work. In the case of a CM at risk negotiation, the designer would assume this risk and will charge the client a premium to assume the risk (Odusami, 2002).

Methodology

It is the intent of this research to not only examine the current position, but also to explore future possibilities and indications of the architect's role. It is for this reason that the research was done through a series of Delphi rounds. Skulmoski, Hartman & Krahn, (2007) said, "The Delphi method is an attractive method for graduate students completing masters and PhD level research. It is a flexible research technique that has been successfully used … to explore new concepts within and outside of the information systems body of knowledge. The Delphi method is an iterative process to collect and distill the anonymous judgments of experts using a series of data collection and analysis techniques interspersed with feedback. The Delphi method is well suited as a research instrument when there is incomplete knowledge about a problem or phenomenon." Also Adler and Ziglio, (1996) said it is "a structured process for collecting and distilling knowledge from a group of experts by means of a series of questionnaires interspersed with controlled opinion feedback." It comprises, as stated, a series of questionnaires administered personally, sent by mail, or electronically, to a pre-selected group of experts. These questionnaires are designed to elicit and develop individual responses to the problems posed and to enable the experts to refine their views as the group's work progresses. Wissema (1982) underlines the importance of the Delphi Method as a "monovariable exploration technique for technology forecasting."

Qualified panel members were randomly selected from a list of pre-qualified candidates who were chosen based on their level of expertise in their given field as it may relate to architecture and the construction process. The panel members were selected from the following disciplines: two architects, two general contractors, two engineers, two construction managers, a specialty contractor, an attorney, an owner – private sector, an owner – public sector, a banker, and a developer, most came from the western part of the United States. The first round of statements was developed to gain an understanding of the positions of the panel members. The second round statements were generated according to the responses received from the first round. The statements that received an 80% rate of agreement were removed. These statements were considered conclusive. All other statements were considered non-conclusive and were resubmitted in the second round. These statements were identical in the second round. Along with these statements, however, the percentage of each response chosen was included. The panel member, in light of the percentages and thoughts of the panel collectively, then had an opportunity to reconsider a response. In addition, several new statements were added to gather additional knowledge based on the conclusive statements of the first round. A third round of statements was prepared, administered, and analyzed in the same manner as rounds one and two.

Findings

The following is a compilation of the results of the Delphi rounds conducted with 13 panel members. The response rate, for the 13 panel members, was 100% for all three rounds of questions. Multiple choice responses were requested on 28 questions, and one question was a fill-in-the-blank. By the end of the third round, the panel

members came to a consensus on 22 of the 28 questions. Of those 22, two received a 100% consensus. One received 92%. Six received 85%. Four received 77%. Two received 69%. Three received 62%. Four received 54%.

The Current Definition of the Architect To determine the role of the architect and the direction in which it is heading, there had to be an accurate definition from which to base any assumptions. Merriam-Webster Dictionary (2006) defines the architect as "1) a person who designs buildings and advises in their construction; 2) a person who designs and guides a plan or undertaking." When the accuracy of this definition was proposed to the panel, only two (15%) of the members thought of the definition as accurate. The majority, eleven (85%), thought the definition was only somewhat accurate.

With that in mind, an attempt to determine a more accurate definition was pursued. Question 24 asked the panel members to select a more suitable definition of the architect today. The majority of the panel (11 respondents or 85%) would define the architect today as one who functions as the creator of the building's design. Of the remaining two panel members, one (8%) selected "one who functions as the organizer of the building's design," and one (8%) selected "other" and wrote "coordinator + creator."

Roles during the Construction Phase The panel members were asked to consider all types of delivery methods and to rate these as to their value and level of significance during this phase of the project. The results ranked the general contractor as having the highest level of influence and contribution. Twelve (92%) of the panel members ranked the general contractor as a level five. The results for the architect and construction manager were more spread out without a consensus on any rating level. The most selected rating level for the architect, selected by six (46%) panel members, was a significance level of four. The construction manager was evenly spread between a rating of two and five with the most selected rating at level five (selected by five – 38%).

Education of the Architect There exists concerns regarding the current curriculum and education/preparation of the architect. Outlined by the National Council of Architectural Registration Boards (NCARB), the curriculum is weighed very heavily in design theory with the intent that the practical, hands-on knowledge will be learned during the internship. To address this concern, the panel was asked whether or not they felt that the students who graduated from an NCARB accredited program are adequately educated for a career in architecture (question seven). Of all the panel members, three (23%) said "yes" the architect is adequately prepared by the curriculum for a career in architecture. Four (31%) said "no" the architect is not adequately educated. Another four (31%) stated that schools provide the architect with proper design skills, but the student must then learn the technical and production skills through on-the-job training. The remaining two (15%) panel members stated no opinion on this question. They were then asked what additional education requirements would benefit the architecture graduate student the most (question 26). Eleven (85%) of the panel members felt strongly that there is a need for more courses addressing construction techniques. The remaining two (15%) panel members selected other; one recommended construction management courses while the other said "all of the above with an emphasis on business management and construction techniques."

Legal Concerns Regarding errors and omissions, the panel was asked three questions: 1) Are the laws fair and just? 2) What is the level of errors and omissions that are found in the construction documents and? 3) Does the number of errors and omissions decrease when a construction manager is involved? The first question, posed to the panel, explains the standard-of-care principle and asks whether it is too lenient, fair and just, or too strict (question 15). Eleven (85%) of the panel members feel that it is fair and just. Two (15%) panel members felt that it is too strict and none of the panel members felt that it is too lenient.

The panel was asked to compare the numbers of errors and omissions on a project in which a construction manager is involved to a project in which there is no construction manager (question 17). (This question only considers the benefits of a construction manager as it relates to errors and omissions and does not consider other potential benefits such as budget, scope definition, or schedule.) Eleven (85%) of the panel members agreed that the number of errors and omissions decreases when a construction manager is involved. Of those eleven panel members, ten (77%) felt that it is somewhat lower and one (8%) felt that it is much lower. Two (15%) of the panel members felt that that there is no change or benefit from a construction manager.

Conflicts and Communication Considering all types of delivery methods and all phases of the process, the panel members were asked to identify the professional with whom the architect will most likely experience a conflict of role (question ten). Eleven (85%) of the panel stated that the role conflict will occur with the general contractor. The remaining two (15%) panel members believe that the conflict will occur with either the construction manager or the owner.

The main catalyst for contention between the architect and the general contractor, according to the panel, is poor communication (selected by 54% of the panel members). Other points of contention, as determined by the panel members and the percentage of the number of panel members who selected each point, are as follows:

- Poor communication – 54%
- Different backgrounds and cultures – 14%
- Project budget – 8%
- Poor quality of performance from either party – 8%
- Different goals and a misunderstanding of the concept of collaboration – 8%
- Deficiencies and incompleteness of the plans – 8%

Impacts to CM The panel was asked to select the primary factor that has caused the role of the architect to change in the past 20 years. The responses varied and did not come to a consensus. The factors, along with the percentage of members who selected each factor, are as follows:

- A rise in liability and lawsuits – 38%
- Lack of hands-on construction experience – 15%
- The design-build delivery system – 15%
- Involvement of a construction manager – 8%
- New technology – 8%
- System complexities – 8%
- Cost control – 8%

Indications into the Future of the Role of the Architect Eleven (85%) of the panel members believe that the role of the architect is not clear and is not heading in a positive direction. Only two (15%) believe that it is heading in a clear and positive direction.

Building Owner The panel was asked about the most effective ways for the owner to save time and money. According to the majority of the panel (eight, or 62%), the best way is to create standards or guidelines for all of their buildings. Five (38%) of the panel members felt that the owner would benefit most from using the same design and construction team across each project. One of these five, however, qualified his response by saying that, "If saving time and money is the objective, it would be using the same design and construction team. For quality it would be creating standards or guidelines or hiring a program manager to oversee all of the projects."

Design Build The panel was asked to determine which professional is more qualified to be the prime contract holder and lead a design-build project. The panel responded in favor of the general contractor by a slight margin. Six (46%) of the panel members would choose a general contractor to be the lead. Three (23%) would choose an architect. Two (15%) would choose a construction manager, and two (15%) said that they would "select the most qualified individual."

Fragmentation and Specialization The panel was asked whether or not fragmentation and specialization will harm the art of architecture and eventually lead to its demise. They could not come to a consensus and were actually split evenly. Seven of the panel members said "yes" it is leading to the demise of the art of architecture while six said "no." To determine why the panel could not agree on this item, further clarification was requested to reinforce the responses. The explanations from those who said "yes" were as follows:

- The architect at one time led the design-build process. Over the years, architects and other professions have either given up or lost aspects of the design process, the estimating, the engineering, and so on. Today with specialization, some organizations only produce documents and no design; others design and do not do produce the documents. Systems are more complex and the architect delegates the design and

implementation to others. An architect must understand the whole to design the parts; the art is the dealing with the whole concept, not just the parts.

- The need for higher quality details and specs has led to architects that specialize in these areas while other architects are more "design" oriented.
- The need for an architect to specialize and concentrate in one area takes him away from his role as the "Master Builder" that knows all aspects of the project from beginning to end.

The explanation for those panel members that selected “no” were as follows:

- Not much fragmentation or specialization is seen, at least not anything that detracts from the Art of Architecture. I think the Art of Architecture is mostly affected by cost more than anything. How much money an owner is willing to put into a project or is able to put into a project determines how much architecture goes into a building.
- There are other matters that are more significant in the change than fragmentation and specialization. Of greater importance might be lack of willingness to lead out due to liability fears. Another is that creative training may be lacking; perhaps due to computer training and new methods of production. Outsourcing of drafting is also a factor.

Design vs. Production Architect On large-scale projects, it is common to have a design architect who works out the schematic design and a separate production architect who creates the actual construction documents. In this manner, the two architects are able to focus more on their specialization. The panel members were asked if they feel that this is a growing trend that will gain popularity and be seen more often in the future. Nine (69%) of the panel members said “yes” and three (23%) said “no.” One (8%) of the panel members choose neither yes nor no and said, “I would hope that the same architect works on the project from design through construction.”

Additional Comments The final question, for each of the panel members, was an open ended question that allowed the panel to elaborate on their responses. The question was; in what direction do you see the role/responsibility of the architect going within the next 30 years (question 23). The responses were as follows:

- The architect needs to take back his/her role as the architect, the vision maker, the conductor. The architect also needs to be more proactive with the general contractor and include his skills during the design process. The architect needs to be compensated to do all that he/she is expected to do.
- The role of the architect will lead to collaboration and to bring all participants together to address complexity. The architect will still design and document, but will have less to do with estimating and just work with the build team to see it through.
- It is becoming a clip art profession with the real effort being left to the construction industry to make it work. This will continue.
- First, architects will be working more and more in design/build and construction management project delivery systems and taking more direction from construction managers and general contractors while still providing creativity and technical information. Second, some contractors who claim to be Design/Builders do not really understand the whole concept of D/B and the role of a true D/B contractor. Therefore, they fail to provide the benefits to the owner that they deserve. This will cause some owners and architects to revert back to "Old School" Design/bid/build.
- The number of their responsibilities is growing.
- The architects will have to have a broader knowledge of all aspects of a project.
- The architect will have to become a much better manager of time, people and consultants as everything becomes more and more complex and specialized. The requirement to farm out most of the parts and pieces of the design, due to complexity/specialization, might require architecture firms to become more of an architecture manager rather than an architect.
- Collaboration of owners, architect, engineers, contractors, and subs is crucial to a successful project. The architect will become more of a team player in the future.
- More specialization and less responsibility for the design work of other consultants.
- Construction management firms are getting more authority, responsibility, and are becoming more efficient in the scope of a full project. Architects are stepping back and allowing this to happen due to their concern about liability, their lack of performance, and that they are not keeping up with the modern trends of the construction industry.
- The architect must be more diversified and be willing to work with construction managers, general contractors and others while maintaining the leadership role on the design portion of the project. The

architect will work with the contractors to assure the intent of the design is obtained; the owner's representative.

- Architects are their own worst enemies. They often don't understand business or costs and are so risk adverse that they seldom take the lead role that they should. Successful firms in the future will be those that breakout of the mold of being "designers" only.

Conclusions and Discussion

Today's Architect

Architecture has been defined as the art and science of designing and erecting buildings. The results from the research show that the primary function of the architect of today is still considered to be the creator of a building's design. While the changes in recent history have not been paradoxical to the profession, they have been significant enough to create confusion as to the exact responsibilities and the expectations placed on the architect and the responsibilities inherent to that role of creator. An unclear definition of the architect can present false expectations of the architect's performance which can lead to role conflicts, poor results, and dissatisfied customers.

Factors Impacting the New Architect

Factors such as new technology, a rise in lawsuits, the introduction of the construction manager, and the design-build delivery system have all influenced the architect of today. When the panel was asked to name the primary factor that has influenced the architect's role and responsibility, a consensus could not be reached.

Education Perhaps a correlation can be made between the third of the panel that were unsure whether the construction manager or the architect is more qualified. The recommendation of the panel to provide more construction-technique experience to the architecture student is valid. By providing the architecture student with construction-technique experience, either in the curriculum or the IDP, the graduate student would be better equipped to oversee the entire project.

Collaboration and Communication An interesting result of this study is the discrepancy between the actual and the perceived-and-desired level of collaboration and communication. Once again architects, general contractors, construction managers, engineers, and sub-contractors all agreed that poor communication is a point of contention.

The construction process, by nature, is contentious and has been so for many years. The architect holds the responsibility of inspecting the work of the builder down to the smallest details and ultimately being the one who accepts or rejects the work. This creates an adversarial relationship. Furthermore, any omissions or inaccurate details in the construction documents will take away from the accuracy of the contractor's budget driving the project cost up with change orders, and delay the schedule while changes are made. All of which can chip away at the profit of the builder.

This research shows that the lack of collaboration and communication is a problem. However, a consensus could not be reached as far as responsibility. But the entire panel agreed that there should be some level of involvement for the construction manager. This unanimous response, along with the inability to select any one professional, suggests that greater consideration should be given to a team approach to have a successful project. Design build appears to be one positive solution that can create a team approach. Design build places the architect and the builder on the same team, hopefully eliminating the adversarial relationship, and elevating the level of communication and collaboration.

Adrian, (2004) said that the most important potential benefit of the construction management process is to "reduce adversary & head toward a team approach." The panel felt strongly about the construction manager being involved in the design phase and that errors and omissions are lower whenever a construction manager is involved, the solution may be the development of a stronger construction management process.

Another obstacle, in implementing a team approach may be in overcoming established stereotypes or traditions. In the traditional delivery method, the adversarial relationships have been considered to be part of the job and have become well rooted. It will take a paradigm shift to enable the various professionals to realize that people no longer want the adversarial relationships and instead favor a team approach.

The Architect of Tomorrow

The role of the architect today is not clear, nor heading in a positive direction. Half of the panel members said the architect's role will be threatened if it continues on its current path. The other half provided suggestions and insight as to what the architect needs to do to improve upon its status and direction. The architecture profession will become more specialized and carry less responsibility. The architect should be responsible for the design and production of the documents, but will have less to do with estimating and other construction related duties. The architect will "work more in design build and CM delivery systems and will take more direction from the CM and GC" while still providing "creativity and technical information."

Architects are stepping back, whether it is intentional or not is unclear, and allowing CM firms to assume their role. The construction manager has been innovative and found ways to improve on efficiency throughout the project. The CM firms are gaining more authority and responsibility. Meanwhile, the architect has allowed this management shift because of "their concern about liability, their lack of performance, and … not keeping up with modern trends of the construction industry." If design and build would once again be molded into the "Master Builder" concept by being one in scope and jointly utilize new technologies, it could make the building process stronger. One of these cutting edge technologies is BIM. Mergenschroer (August, 2009) said, "In my thirteen years of being in the Engineering and Construction industry, I have seen many changes that have benefited the Owners, Architects, Engineers and Contractors. However not all of these changes benefited the entire group. I see BIM as the total package. BIM has the power to change the way we do business. How we implement the BIM process into our daily work schedules is the challenge." Also, sustainability for life and buildings are real concerns for the industry today. In fact, Kibert (2008) stated "The high performance green building movement is said to be the most successful environmental movement in the United States, certainly the fastest-growing and highly successful at creating partnerships with a broad cross section of manufactures, builders, and others who are not often allies with (the) environment." The building industry can not afford to ignore these two important issues and both require the collaboration of design and build. The architect can play the lead role in for BIM and sustainable design. The architect can change this direction by taking back the role as the "vision maker" and the "conductor" of the project. First, the architect must be more diversified and acquire "a broader knowledge of all aspects of a project." Second, the architect will have to "be more proactive with the GC and include his skills during the design process. The GC will need to "be willing to work with the CM's and the GC's while maintaining the leadership role on the design portion of the project." Third, the architect will need to develop business skills. As projects become more complex and specialized, there needs to be someone who can manage all aspects of the design, including "time, people, and consultants."

Successful architectural firms in the next 30 years may be those that "break out of the mold of being designers only" and look at ways to reclaim their lost responsibilities and also explore adding new alternative services. New alternative services could come from specialization to growth and complexity, or from the needs of building owners. Building owners of the future will be looking more for someone to create standards and guidelines for their buildings. For example, corporations such as Target deliver more than 110 new stores and 80 remodels across the country every year. "To ensure consistent improvement they have developed evolving standards, prototype building designs and a well-populated cost history database for estimating new projects" (Thomsen, 2006). Facilities such as Rice University are able to create impressive buildings through world-renowned architects. However, the campus has recognized that strong design-oriented architects were focused only on design. For that reason, Rice University now hires another architecture firm that is "skilled at construction documents and project management as the executive architect." The design firm will then become a sub-contractor to the executive architect. The executive architect will create the standards and guidelines for the project and then continues to manage the design architect (Thomsen, 2006).

Recommendations/Implications

Another study might provide insight into the reason why communication is so poor between the two professions and continues to be poor when both parties agree on the importance of communication. It could also provide insight on how to improve the relationship. Another productive study would be to examine possible delivery methods and the level of teamwork that is fostered by each delivery method. Design build is a delivery system that appears to resolve many of the liability and teamwork concerns. However, since the introduction of design build, the predictions of its growth seem to have fallen short of what was expected. Dan McCarthy (ENR, 2009) says "More clients now request design-build … although the design-build market hasn't fully matured." It would be a valuable study to determine exactly why design-build has not been the solution it was thought to be. Furthermore, research could explore what benefits could an architect or construction manager provide as the lead that the general contractor could not?

One of the primary factors that have impacted the role of the architect in the last 30 years has been lawsuits and liability, but also laws, regulating errors and omissions are fair and just. The level of errors and omissions in a set of construction documents is "too high." A valuable research topic would be to determine the types of lawsuits that are occurring; to what extent they are impacting the industry, and what trends or patterns can be found in the lawsuits against the architect. Trends that are beginning to appear, such as the fragmentation of the architect into a design architect and a production architect, are new and have had very minimal research conducted to analyze its pros and cons.

This was a comprehensive study endeavoring to understand the role of the architect in a continually evolving building industry. Clearly, there are many more levels to this understanding that are still not realized. However, the study has brought to light some interesting aspects of the dynamics in the building industry that could have bearing upon how the role of the architect is perceived and how it is directed now and into the future. The roles of architect and builder are changing. The concept of Master Builder seems to be coming full circle. The construction manager has also emerged as a pre-dominate figure in the success of sophisticated building projects today. Other answers to the way a project is delivered are emerging as more practical and efficient alternatives for today's world and economy. The interesting data revealed in this study is one important source for the building industry to draw on to develop a new ways to perform the service it provides and a better way to do business in general.

References

Adrian, J. (2004). *Construction Productivity: Measurement and Improvement.* Champaign, IL: Stipes Publishing L.L.C

Adler, M. & Ziglio. E. (1996). *Gazing into the oracle: The Delphi Method and its application to socialpolicy and public health*. London: Jessica Kingsley Publishers.

Berman, G. (2003). Are Foxes Watching the Owner's Hen House? An Examination of the Architect's and Construction Manager's Roles in Managing & Administering the Design & Construction Process. *CM eJournal*, 1-27.

ENR, (September, 2009). *Design-Build Saves Time.* Retrieved September 10, 2009 from, http://enr.ecnext.com/coms2/article_bmpd090902DesignBuild.

Kibert, C. J. (2008). *Sustainable Construction: Green Building Design and Delivery.* Wiley and Sons Inc., Hoboken, NJ.

Mergenschroer, M. (August, 2009). *Why BIM?* Construction Industry Forecast. Retrieved September 10, 2009 from, http://www.reedconstructiondata.com.

Odusami, K. T. (April 2002). Perceptions of Construction Professionals Concerning Important Skills of Effective Project Leaders. *Journal of Management in Engineering*. Vol. 18, No. 2, 61-67.

Skulmoski, G., Hartman, F. T., & Krahn, J. (2007). The delphi method for graduate research. *Journal of Information Technology Education*, 6, 1-21.

Taylor, M. J. (March 2000). Return of the Master Builder. *Civil Engineering*. Vol 70, Issue 3, 40.

Thomsen, C. (2002). *Integrating Architecture, Engineering and Construction Services*. Retrieved August 23, 2005 from http://www.3di.com.

Widener, C. R. (2000). *The Next Generation Architect: Using CM to take control of Design and Construction.* Presented at the AIA Conference: Springfield, OH.

Woods, M. N. (1999). *From Craft to Profession: The Practice of Architecture in Nineteenth-Century America*. Berkeley & Los Angeles: University of California Press.

Wissema, J.G. (1982). Trends in technology forecasting. *R & D Management*, 12(1), pp. 27-36.