



Journal of Building Information Modeling

An official publication of the National Institute of Building Sciences
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National Institute of Building Sciences: An Authoritative Source of Innovative Solutions for the Built Environment

Spring 2010



BIM and FM: The Portal to Lifecycle Facility Management

Implementing Building Information Modeling in the Top 100 Architecture Firms

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BUILDING INFORMATION MODELING (BIM) IS CONSIDERED one of the hottest design and construction trends, with a previously sluggish adoption rate starting to climb (Cramer, 2007). While software vendors endorse BIM as the answer to waste and ineffectiveness, its adoption has yet to attain widespread recognition. Approximately half of large architecture firms have acquired BIM software (AIA Market Research, 2007). It is unknown how many small or medium firms have done the same. A recent study was conducted to assess the perceptions of leaders at large architecture firms about the challenges of implementing BIM. It is intended that this study will aid decision makers in other architecture and design firms to develop successful BIM implementation strategies.

SURVEY RESULTS

The population of interest for this study came from the top 100 architecture firms as recognized by *Architectural Record* (Linn, 2008). Voluntary and confidential participation was requested from one member of each of the firms' senior management. Representatives from 48 firms self-selected to participate in this study. The average respondent has almost 21 years of experience, is between 41 and 50 years of age, is at the Director level in his or her organization, holds a bachelor's degree as the highest earned degree, and belongs to more than one professional organization. The majority of respondents (61.2 percent) are members of the American Institute of Architects (AIA).

The fact that 45 out of 48 firms (94 percent) represented in this study are using BIM is a testament to its impact on the architecture industry. This percentage is much higher than anticipated, as previous studies have reported a 35 to 50 percent usage of BIM (D'Agostino, Mikulis & Bridgers, 2007; AIA Market Research, 2007). Representatives from these 45 firms completed an online survey of ten open-ended questions about the process of integrating BIM into their firm. Due to the open-ended nature of the questions, respondents could indicate one or several responses to each question.

The findings from this study support, contradict and add to prior knowledge on BIM adoption and implementation (McGraw Hill Construction, 2008). When asked about who made the decision to implement BIM in their firm, 56 percent of respondents indicated that senior management made the decision. Other employees were often involved in this decision, as BIM impacts many different departments. Most firms (34 percent) adopted BIM in 2006 and its average use across this sample is three and a half years. Forty-one percent of a firm's projects (mostly medium size) involve BIM and coincidentally, 41 percent of their staffs are trained to use this technology. Forty-nine percent of this sample recognizes BIM's impact on the design process due to the need for earlier visualization and decision making, and BIM's ability to improve internal and external collaboration. A majority (84 percent) of firms experienced resistance from their personnel in making this transition, especially from Project Managers and

"seasoned" professionals. Successful strategies for overcoming this resistance included extensive training and support by senior management. The majority of firms (71 percent) used multiple methods for teaching their employees BIM, including formal and informal training by vendors and key firm personnel. Forty-five percent of firms perceived personnel resistance as the major obstacle to initial BIM adoption, followed by software/technical problems, high cost and the absence of external collaborators. Personnel resistance remains a continuing challenge, as does articulating BIM's return on investment, and determining which type and size of projects best utilize BIM's strengths.

Train employees by using a progressive BIM training program that moves from formal training at an external location, to formal training within the firm, to continuous informal internal training through group discussions and mentoring.

IMPLEMENTATION STRATEGY

As CAD has replaced the drafting table, it is inevitable that BIM will someday replace CAD. An implementation strategy is important for the successful deployment and acceptance of BIM with firm employees. It should address how BIM will coexist with existing 2D CAD and other 3D modeling applications as the abandonment of these applications right now is impractical. The progressive migration from CAD to BIM at a steady pace will allow the firm to leverage its past investments in software and training with current expenditures on new software, hardware and training.

Where should a firm begin? Deep-seated change does not result merely from the introduction of a better technology. Firms interested in implementing BIM should read all about BIM technology and its impact on the design process. Key decision makers should seek out colleagues in other firms and through professional organizations who have transitioned (or are in the thick of transitioning) to BIM.

As evidenced in this study, buy-in from senior management is important. Yet group decision-making is often used for big decisions like this. A transition team should be formed that includes progressive individuals who understand the ramifications of BIM across the entire organization. Essentially, this team becomes evangelists for change. As such, team members should come from across the organization.

More than the CAD operators will be impacted by this shift. Team members should have credibility with their colleagues and empathy for them as well. Train employees by using a progressive BIM training program that moves from formal training at an external location, to formal training within the firm, to continuous informal internal training through group discussions and mentoring. When a firm is ready to initiate BIM, begin with one project

or one division of the firm (like the hospitality or workplace section). Start with a typical project that the firm knows how to handle. For example, if the firm specializes in healthcare, design a medium-sized healthcare project on BIM. Therefore, the learning curve would only involve the technology and process, not the project content. As the transition commences, continually analyze BIM's impact on the design process and how improvements can be made when using this technology for the next project.

As pressure increases for faster delivery times and more competitive fees, external pressure from clients will drive more firms to use BIM. A partner from one firm succinctly declared BIM's impact on the firms' design process as "Bigger, Better, Faster, More."

CLOSING

BIM is impacting more than the information technology department, as firms grapple with changes to the design process, business practices and means of collaboration with other stakeholders. As the percentage of design projects and design staff trained in BIM steadily rises, the continuing challenges of personnel resistance and "best fit" for BIM are projected to diminish, resulting in increased opportunities and competitive advantages.

There are no shortcuts to BIM implementation. It is a misconception that business can go on as usual; that change is unnecessary and retraining is avoidable. Decision makers must ask themselves if the benefits of BIM outweigh its costs of adoption. As pressure increases for faster delivery times and more competitive fees, external pressure from clients will drive more firms to use BIM. A partner from one firm succinctly declared BIM's impact on the firms' design process as "Bigger, Better, Faster, More."

Until BIM becomes mainstreamed, adoption will continue one firm at a time. Results of this study depict BIM's widespread acceptance, yet slow and steady implementation. Challenges will persist during this time of transition from CAD to BIM, particularly from a firm's personnel. The overall consensus of firm representatives who participated in this study is summarized by one firm's CIO, who stated, "we are very happy with the decision to move to BIM and we think it is the way of the future for the AEC industry."

Reluctance to jump in the water is understandable. Firms may be waiting for issues such as universal BIM standards, true software interoperability, and change in design methods and processes to be resolved. However, waiting on the shore will not prevent the ship from sailing. ■

References to this article are available by emailing ssavory@matrixgroupinc.net.

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