



How BIM is Changing the Construction Industry

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BIM is about unlocking the power of information. Building Information Modeling (or BIM), is the latest technology in the construction industry that provides a digital representation of the building process used to facilitate exchange of information in digital format for the project team.

This technology allows us to see, coordinate, inform and build a better building by generating a 3D Model. The model encompasses geometric and geographic information (the “I” in BIM) of the building and properties of its components and creates a single repository of design and construction documents, specifications and schedules. When the team is linked to a single data source, the often siloed functions (consultants and subcontractors) can see beyond their own interest to a more holistic view of what the design is trying to achieve.

BIM facilitates a cultural shift toward collaboration. This technology is cutting edge in the industry; however the most important thing to consider about BIM is that there must be an internal culture that supports collaboration and the practical use of these tools. BIM facilitates a much higher level of coordination among the clients, and design and construction team. However, there must be a cultural shift from the traditional design-bid-build methodology which typically leads to adversarial relationships between the architect and the contractor, to a spirit of total team collaboration which is inherent in the process. The value of the relationships among team members should not be underestimated.

BIM provides both tangible and intangible cost savings. Adding the power of virtual design coordination provides tangible examples of enhanced constructability and value management, as well as the efficiency for prefabricated assemblies. Time and space clashes between various disciplines are much more readily identified in 3D, such as pipes running into HVAC and cutting through a floor. To date, identifying and fixing these issues ahead of time has been one of the most utilized aspects of BIM technology which can easily save a project thousands of dollars and weeks of wasted time waiting for components to be fabricated. 3D visualization supports the design and construction industry with these aforementioned ‘direct’ (or tangible) savings and ‘indirect’ (or intangible) savings resulting from minimized design and onsite construction time and associated administrative and general conditions costs.

BIM is much more than creating a 3D model. Adding 4D (time) and 5D (cost) provides the ability to demonstrate how redesign impacts the program and budget. This technology is becoming more prevalent because it maximizes BIM’s potential in the design and construction process, particularly in the pre-construction phase of a project. 4D helps to answer the question: What impact will this change have on



3D BIM Model



Under Construction



Completed

the schedule? More importantly, what will the impact be on the end users and project stakeholders? 5D integrates the estimate model with Timberline Estimating and MS Excel and provides a visual quantity take off. 5D identifies design changes and updates quantities in real time. Put another way, 5D is a visual estimator with a Timberline database. 5D also assists with developing cash flow analyses and calculating project staffing requirements.

BIM provides critical information to support Facilities Management.

BIM helps facilitate the analysis and comparisons of various energy alternatives to help facility managers dramatically reduce environmental impacts and operating costs. The Information about building equipment stored in BIM models eliminates months of effort to accurately populate maintenance systems. The “living” BIM model provides an easier means of representing 3D aspects of the building and provides enhanced information about existing conditions, reducing the cost and complexity of building renovation and retrofit projects. Some building design professionals are embedding data on life expectancy and replacement costs in BIM models, thereby helping the client understand the benefits of investing in materials and systems that may cost more initially, but have a better payback over the life of the building.

With BIM there is still somewhat of a fear of the unknown. Many professionals within the industry have not embraced the full potential of the technology and are only using 3D to provide an enhanced project rendering. The barriers of data ownership and intellectual property still remain. However, the careful selection of partners will ensure that it works because all have a similar collaborative philosophy –that they will reap long-term benefits by creating sustain-

able relationships with each other and their clients. Based on where the construction industry is headed, there will eventually be a transformational change as the trend toward integration across the entire life span of a project becomes greater: from concept to construction, to operation and ultimately decommissioning.

Future of the BIM workforce. The BIM Empowered A/E/C Profession will invariably be composed of individuals with

ranges of technical skills and professional experiences from different generations. This multi-generational, ad hoc team depicts how the Gen Xer is a likely fit for this revolution, how the Baby Boomer has to adapt to survive, and how the Millennials are poised to transform BIM from a novel process to an industry norm.

Designers and builders at all levels of the profession have been impacted by the emergence of BIM. This shift, with a heavy reliance on technology and input from builders during the design process, will empower a new generation of A/E/C professionals and advance them into leadership positions very early in their careers.



Marcia Kellogg has 20 years of professional services marketing experience, having served in this capacity for architectural, engineering and construction management firms throughout Connecticut. A past President of the Connecticut chapter of the Society for Marketing Professional Services, she has conducted seminars in marketing and facilitated numerous programs to benefit the industry. In 2011, Marcia received the SMPS CT Member of the Year Award for outstanding, dedicated service. She also serves on the Board of the ACE Mentor Program of Connecticut and is Mentor to high school students looking to pursue careers in the architectural, engineering and construction fields.