Technical Solutions are Just the Half of It

BY LUKE FAULKNER

The other half of BIM implementation involves true collaboration and the willingness to try a new approach to project design.

IT'S IMPOSSIBLE TO MISS. OVER THE LAST THREE YEARS, there has been a meteoric rise in BIM interest. That which was formerly the domain of a small number of specialists and academics has expanded to be included in the education programs of almost every industry group.

There are myriad guides to BIM for public use, and the A/E/C community has now seen its first BIM-specific contract forms. BIM has very much begun to permeate the mainstream; the terminology, education, and discussion are all commonplace. BIM in practice, though, still remains relatively rare.

To be fair, most surveys, both scientific and non-scientific, indicate that BIM usage and implementation have expanded substantially in the last several years. It hasn't, however, grown at the rate one might expect of a technology with so much promise. How can this be?

Answering that question requires a slightly different perspective on BIM. It's important that BIM be regarded as a combination of technology *and* process. What exists with BIM is not only a more capable technology but also a better, more collaborative—yet new and unfamiliar—process.

Dictating Process Change

The success of BIM hinges in large part on team collaboration. The traditional methods of contracting (design-bid-build and hard bid) do not facilitate the trust and synergy that is required of a build team executing a BIM-based project. A build team that lacks this trust or familiarity will almost certainly not work closely enough to be effective, and therefore will not achieve project goals.

Clash detection serves as a classic example of this collaboration. The sophisticated software required to run effective clash-detection programs has existed for some time. The software to import multiple platforms from a variety of disciplines does a respectable job of detecting interferences between multiple systems in a building. What happens, though, after the clashes have been detected? In a successful execution, such as with Turner Construction's virtual clash room, the build team is physically assembled in one place to review and resolve the clashes in a group setting. In this setting, clashes are noted, a solution is agreed upon and reached, and the model is updated; clashes are eliminated.

That this solution is reached with the help of technology is not the key point. We've always searched for clashes; the medium has just changed, from light table to software. What is remarkable are the subsequent steps taken after clashes are identified. In the days when a light table was used to find clashes, the next step after discovery typically would have consisted of a slew of RFIs and requests for change—likely followed by a period of bickering and finger-pointing. This has been replaced with the aforementioned collaborative methodology. So not only has a better tool—BIM—been developed, but also a better practice is evolving that allows optimized use of that tool.

Creating New Contracts as an Adaptation

One particular role that will require a shift in thinking is the contract arena. For years the A/E/C industry has been using the same standard contract forms that have pushed risk down the line, rather than attempting to shed risk through collaboration.

It's only in the most recent months that standardized, BIM-specific contracts have become widely available to the A/E/C industry. Previously, those wishing to use BIM had to rely on custom documents, contracts written by in-house legal counsel, or traditional standard contract forms that didn't necessarily allocate risk or responsibility properly for the digital environment. People were uneasy about the lack of precedent and case history regarding BIM projects.

For those that were willing to take a chance, were well versed in BIM, or had a lot of trust in their build team, this was something they were willing to overlook. They possessed a comfort level and a familiarity that offset the risk of a less-than-ideal contract. For the great majority, this was an unacceptable risk; not only was too much left to chance, but on a larger project it became increasingly difficult to obtain bonding or insurance, as potential insurers were nervous about the risk of blurred lines in design and intent.

The fact that multiple contract forms evolved from this serves as proof though that the industry is capable of adapting to the change BIM is bringing about.

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How We Challenge Ourselves

This all begs the question: What is really inhibiting BIM from exploding? What is preventing BIM from becoming the dominant method of contracting and executing construction projects? The answer is largely between our ears. The technology required is widely available. While it is not yet perfected—one could argue that technology rarely ever is—it is certainly widely available to the public should they wish to purchase it. Most potential users feel quite a bit of apprehension in taking on the challenge of launching a BIM program or are intimidated as to how to go about doing so.

In terms of BIM start-up cost, a reasonable approximation is $60,000 per person. This includes:

- $25,000 in software
- $2,000 in new hardware
- $3,000 for outside training
- $30,000 in downtime and learning curve

If a steel fabricator operates at 5% profitability, for example, this requires $1.2 million dollars in new work to generate the profit required to offset the cost of training and implementation for a single seat. In this example, apprehension is certainly warranted, considering the increased revenues a firm would need to support one BIM modeler, let alone a firm-wide BIM program.

So is a small- or medium-sized firm precluded from ever using BIM in day-to-day business? Of course not, but a positive attitude on its own is certainly not enough to offset the increased billing that would have to occur in this scenario.

A well-managed implementation plan is essential. A more attainable approach to BIM implementation might consist of selecting a small number of people (one to three in this example) and naming them the firm's "BIM group," then expanding the program contingent on this group's success. This phased, benchmarked approach requires a much smaller initial investment, allows the remainder of the firm to continue working as usual, and allows the firm to better absorb any bumps that might be encountered.

Fostering a Culture of Collaboration

A unique sociological challenge that firms may encounter arises from the amount of internal collaboration practiced within the company. In the past, plan review could be largely compartmentalized, as a set of 2D paper plans could be pulled apart and reviewed separately with little or no coordination within a team. Such is not the case with BIM. Models are not broken apart as easily, and review is not as simple as handing half the contract documents to one person and half to another. The challenge that exists is actually in physically bringing people together to accomplish this. This business model allows reviewers working in separate offices, if not separate cities.

Traditionally, software proficiency has been seen as a critical hurdle to a company's BIM capabilities. However, communication proficiency can be every bit as challenging, if not as important. Says David Ivey of architectural firm HOK, Chicago, "What I can say is that yes, we feel there is a definite learning curve to BIM collaboration methodologies that everyone is still trying to overcome." This underscores the importance of adapting not only the technology but also our working procedures if the A/E/C world is to successfully adapt to virtual construction.

BIM implementation is as much about our willingness to break out of the mold and apply new methodology as it is about software capability. New standard operating procedures will have to be developed and mature, in concert with technical advances, for the industry to use BIM to its full potential. MSC