

A Valuable Tool for Architects: Capitalizing on Available Technology

“Once a new technology rolls over you, if you’re not part of the steamroller, you’re part of the road.”
—Anonymous

Nearly all architects have for years been using two-dimensional computer-aid drafting technology to create the drawings of their buildings for construction. Now, many firms are undecided on whether to embrace more advanced three-dimensional software technology that may soon become the standard on how buildings are conceived and constructed.

It’s called Building Information Modeling (BIM) technology. It has been in existence for years but has recently evolved to become more accepted by firms of all sizes as a tool for more coordinated designs in the creative process from project concept to actual construction.

Wider implementation

There are still opponents of BIM, but the trend is clear: It’s here to stay and most architects are recognizing its growing influence, applications, and benefits. ABA Architects, a 30-year Tucson firm, has embraced the technology through ArchiCAD software and even conducts monthly user group meetings to assist others to adopt the software. (Another widely used BIM software program is Revit, an add-on software for AutoCAD by AutoDesk.)

BIM technology allows both the client and the contractor to participate in the design process in a much more collaborative way that allows a more efficient construction process, particularly in coordinating systems and tracking time and materials. Technology has created opportunities for architects to develop new ideas and to present them three-dimensionally to the owner and others invested in the project.

Each consultant in the design and construction process can benefit from using these new strategies. The majority of Tucson architecture firms are small to medium-sized businesses, and information created with BIM technology can be shared between those firms and their outside engineering consultants to facilitate accurate documents.

The definition of BIM

With BIM, buildings are conceived and drawings are developed in a three-dimensional virtual world. This ability to create a “virtual building” means that all of the elements of a building are created and integrated much the same way the contractor will construct the building. Each element is fitted to others so that one can look at the “virtual building” from any point and will be able to experience the actual building.

With the level of detail that can be established in the “virtual building” model, quantities of materials can be derived and cost projections developed. As the building envelope changes, quantities are automatically updated. Working with consultants and

contractors using the 3D model, the architect can isolate or combine individual systems to aid understanding of the interface of different elements.

Helping the client

Conventional architectural drawings are graphic abstractions of a vision in the architect's mind. Architects believe they have conveyed that vision accurately to their clients and contractors. That is not always the case. For many people, clearly understanding two-dimensional drawings is difficult. With the "virtual building" model, the client and contractors can actually see the building from the beginning of the design process. The ability to make value judgments based on better knowledge will enable more thoughtful decision making.

When involved early in the design process, the contractor will have an intimate knowledge of both the intent of the design and the specifics of the building systems. The potential is there to involve their major subcontractors in the design process as well, so that coordination between trades can be established early. As for savings, a study done in 2004 by the National Institute of Standards and Technology placed the annual cost of inadequate inoperability in the U.S. capital facilities industry at \$15.8 billion. Clearly, this number should be drastically reduced via the use of BIM.

Final analysis

Detractors of BIM frequently claim the technology will be the magic bullet that kills design and turns architects into technicians. But as the American Institute of Architects wrote recently, "...Architects can attain higher profiles, produce more work in a richer environment, and buildings will go up with more precision and higher quality to the benefit of all." In the end, it's hard to argue with that.