



Susan Pruchnicki called building information modeling a "paradigm shift" for architects, engineers and builders.

BIM software presents future of building industry

HOK, Jacobs among area firms using the technology

IT ON STEROIDS

Powerful and versatile software known by the acronym BIM (building information modeling) is reshaping — in some cases, already has reshaped — the architecture, structural engineering and construction industries.

BIM generally is regarded as the successor to computer-aided drafting (CAD), which over the past few decades replaced hand drawing as the architect's way of creating a building design. But that simplified explanation doesn't begin to scratch the surface of what BIM is and what it does for everyone throughout the building process.

Susan Pruchnicki, a principal with Bold Wolfe Architects Inc., said BIM is not only a dramatic evolution of technology, but "a paradigm shift" in the way she and her colleagues approach and execute their work.

Is BIM another dimension? Try several other dimensions. Joel Westman, a principal at Jacobs, said BIM adds three more dimensions to a 3-D model.

"The fourth dimension is implementing a schedule, the fifth is cost, and the sixth is constructability issues," he said. "For example, if you have a 12-inch beam and an eight-inch window, (BIM) tells you the beam has to go in first."

BIM will sequence the project to facilitate material orders and delivery and other aspects of construc-

tion. Andrew Gayer, a vice president and structural engineering principal of HOK, referred to this capability as "clash detection," the ability of BIM to foresee construction problems before they happen and make adjustments in materials and schedules accordingly.

The software can improve communications among architects, engineers, subcontractors, general contractors, and building owners at all stages of a project, Pruchnicki said, because it makes sharing information much easier than transferring paper documents and files. Owners like it because they are able to see exactly what their project will look like.



Andrew Gayer

Owners will like BIM long after their project is completed because the computer file then becomes an "owner's manual" for the building, Gayer said. The database that BIM builds contains such information as model numbers and serial number dimensions for a building's components and systems, facilitating maintenance and upkeep.

Gayer said the St. Louis office of HOK started using the software seriously about three years ago. It's being used for about 60 percent of the company's work now, and he said it has been employed on about 100 projects worldwide. He said the software provides automatic updates each time a design is changed so estimators know what total quantities of items

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are used and what the costs will be. While BIM is a recent development, it is not new. Weselman said Jacobs has been using BIM for about 10 years, but "we really have embraced it in the last three years or so, as the software companies have placed more emphasis on making it into a useful tool."

"We can spend more time on architecture and less on the accounting side. (BIM) allows us to create objects, volumes, and spaces faster."

Susan Pruchnicki
Lead 3D Architect

"When you put in walls, or systems, it calculates quantities as you design," he said. "You can really see the influence (of design choices) as to how it affects the budget."

A big advantage is that BIM enables designers and engineers to run simulations for things such as energy use. "You can do 'what if' scenarios," Gayer said.

Pruchnicki said her firm used BIM on a renovation project for the Maplewood Public Library, and it proved valuable in identifying construction conflicts prior to beginning actual work. "We can spend more time on architecture and less on the accounting side," she said. "It allows us to create objects, volumes, and spaces faster." The program also estimates costs as the design evolves.

Gayer noted that the software is so powerful that HOK had to upgrade its computer hardware to handle the program's capabilities. For a large project in Saudi Arabia, he said, his team spent three to four weeks learning all that the software could do. Once that was done, he said, the work was done "in about half the time normally necessary, with half the staff."

Gayer estimated that just the software licensing and necessary hardware upgrades for BIM would run from \$2,500 to \$5,000 per employee using it. Pruchnicki estimated that by the time software, hardware, and training are completed, the cost would be about \$10,000 per employee.

Weselman said certainly BIM is an expense, but he believes small firms will find a way to embrace it, because it is becoming the standard.

Pruchnicki, who has been using BIM for two years now, said there is a learning curve for the software, but "people fresh out of college pick it up fast," as do people who never learned CAD.

Weselman, an architect with more than 30 years of experience, said BIM is the future. "As with any software platform, there will be many revisions and enhancements as it evolves," but saw BIM as a tool toward helping his firm achieve "better, faster, cheaper" results for clients.

"We definitely see this as the next standard," said Gayer. "Just like when CAD replaced paper, this eventually will replace CAD."

Gayer and Pruchnicki noted that the federal General Services Administration now requires projects done for GSA to be done in BIM. Gayer said that eventually, BIM will become an international standard; however, that time is a while off as industries work to reach consensus on definitions and other things. And, he noted, potential legal and insurance questions may take years to resolve.

All three professionals agreed that BIM represents a substantial cost to an architecture or engineering firm, but that the investment was worth the results. They said even smaller firms could find ways to afford BIM so that they could remain competitive.

Gl' Stuenkel is a St. Louis freelance writer.

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From BIM to reality



Susan Pruchnicki said using BIM on a renovation of the Maplewood Public Library helped identify potential construction conflicts.