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Creating a virtual 3-D model

So-called 'BIM' technology makes building design process more efficient

The Business Journal of Milwaukee - May 19, 2006 by Pete Millard

Imagine viewing a three-dimensional, animated software program of what a new building will look like and how it will function months before construction actually begins.

Building owners love the technology. Municipal officials who must approve the project prefer a 3-D preview over the old standbys -- two-dimensional drawings and elevations.

Architects and engineers using a computer-aided design concept known as building information modeling (BIM) understand that the virtual 3-D technology is changing their professions for the better.

The technology allows building designers to work faster and cheaper, and to create a project that a client can see in real time before one spade of dirt is turned.

If more building owners knew building information modeling was an option as part of the decision-making process of constructing a new building, more clients would demand that their design teams use the concept, said Kevin Connolly, owner and president of Kevin J. Connolly Architects Inc., Milwaukee.

"Clients don't know they have a choice," Connolly said.

Building information modeling involves more than transferring electronic versions of paper documents to a compact disc, Connolly said. It also entails more than artistically sharp 3-D renderings that dazzle a client. The model contains construction documents and building information that can be exchanged and reused by a building owner, architect, building engineers and contractors.

"The modeling program leads to better collaboration between architect and owner, owner and contractor, and contractor and suppliers," Connolly said.

Shows a building's impact

The program shows how the building fits on a site and how the project will impact a city or village.

"Plan commissions love it," said Connolly, who first used building information modeling five years ago.

The building information modeling software program was created in the mid 1990s by a Budapest, Hungary, company called Graphisoft. The virtual building program, known as Archicad, is used worldwide by architects for exterior and interior design and by engineers for analyzing a building's operations.

Although the use of building information modeling is in its infancy among U.S. architects, state of Wisconsin and federal government

service agency building projects are asking architects to provide the model on some projects.

"The technology is still getting off the ground, but will pick up speed rapidly as more people request it," said Rick McElvain, an engineer for Arnold & O'Sheridan, Brookfield.

As more government agencies ask for the technology, it also will gain acceptance among building designers.

While building information modeling improves the coordination of a construction project, it's also a tool that an owner can use throughout the building's life cycle, said Steve Roloff, an engineer with Arnold & O'Sheridan.

When an owner chooses to use building information modeling, the owner keeps the program and can use it in the future if the building is remodeled or expanded. Changes to the building can be added to the building information modeling program that show how modifications will look and work in a building, said Roloff.

Architects and engineers who use building information modeling save money on designs by cutting down on mistakes. With the modeling software, owners can see more clearly how a building will operate according to a specific design. Also, when a door or window location is changed, for example, the modeling program automatically makes adjustments in the building plans and documents.

"There are fewer change orders on projects that use building information modeling," Roloff explained.

ProHealth Care, the Pewaukee-based health care system, will use building information modeling in the planning stages for its $41 million expansion in Oconomowoc later this year. ProHealth is working with Connolly to design its 85,000-square-foot physician center near the intersection of Highway 67 and Interstate 94.

Connolly also used building information modeling when he was hired to design the interior of the 34,500-square-foot Milwaukee Public Market in the city's 3rd Ward.

The $11 million market has 20 individual vendor spaces that Connolly created with the program.

"The big question we had was: Would everything fit?" said Brian O'Malley, director of the Milwaukee Public Market.

With building information modeling, Connolly was able to deliver several options on how cases, counters and other work spaces could be arranged inside the market. He also could show how each option affected traffic patterns.

"Using the program, we eliminated design mistakes, and that saved money," O'Malley said.

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