

# Building in 5-D

## BIM: the concept reshaping the building world

BY HEATHER SKYLER

Good old-fashioned pencil and paper will probably always be used by architects at some stage in the design process. However, AutoCAD, the popular drafting PC application that has been an industry standard for more than twenty years, is fast becoming a bit of a dinosaur.

The wave of the future for everyone in the construction industry – architects, engineers, builders – is something called building information modeling (BIM), and the wave is beginning to wash over Madison.

Building information modeling is the concept, and the tools involved are new computer software applications that allow an architect to create 3-D images of their projects with quick elegance. IN BUSINESS spoke with several firms in Madison using Revit, in large measure the BIM software of choice, primarily because it matches up easily with their current AutoCAD software.

It's not as if 3-D images weren't possible to create in the past – AutoCAD has the capability – but the time it took and the information that had to be stripped away in the process, such as schedules and cost, made it an unappealing option. With Revit and other similar tools made by Autodesk, Bentley Systems and Graphisoft, 3-D design has become easier to achieve and rolls several other benefits into the package.

Local architecture firm **Potter Lawson** is currently using Revit in a joint building project with the construction firm **Findorff**. The building, currently in the design phase, will be a 44,000 square foot, four-story office building with a lower level parking garage.

**Scott Kammer**, a designer from Potter Lawson, describes the building's location as a "tight urban site close to the lake." Kammer said being close to a body of water can make the design process tricky, especially when a lower level parking garage is

involved, "and one of the ways Revit makes the process easier is by allowing us to explore the site in several different ways very quickly. With some of the difficult site considerations, that's nice."

According to Kammer, once the 3-D model is built in Revit, a user can take any cut or view they want to see, and you can do it quickly. "It used to take a long time to generate different views," he said. "Now we can build one model and take the sections we need afterwards."

Another benefit of Revit, according to Kammer, is the fact that it allows architects to focus more on quality of design because there's extra time freed up to do so. "People are excited because they're able to spend more time designing rather than drawing lines representing what our design is," said Kammer.

It also allows architects to focus additional energy on the structure of a building, eliminating "a lot of the mundane steps we

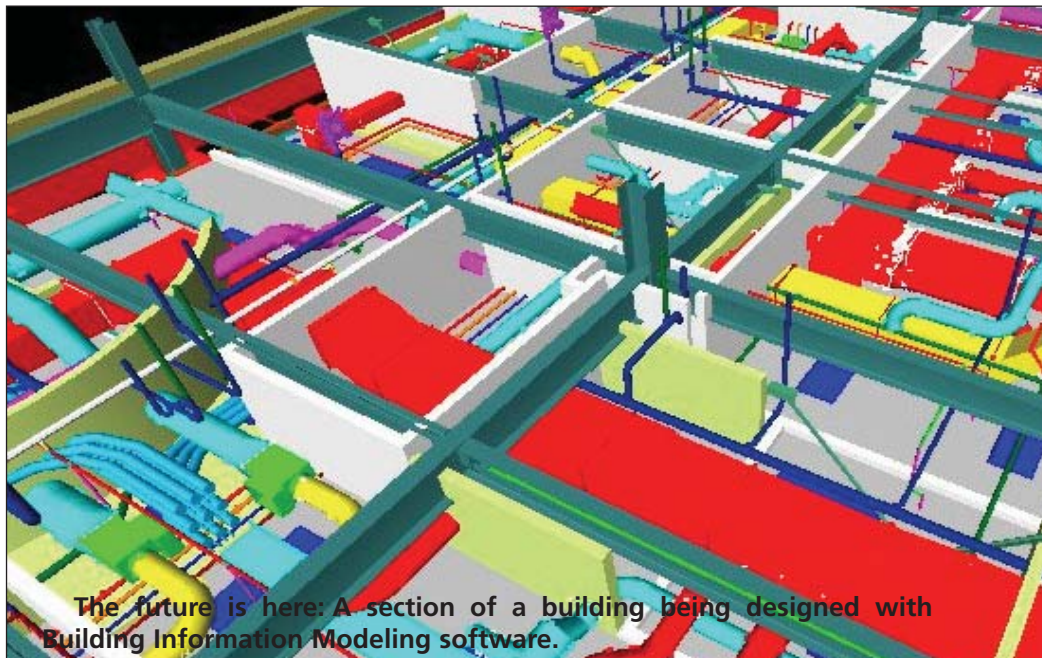
usually take so we can spend more time studying the section rather than representing it."

### SOMETHING FOR THE CLIENTS

This time-saving aspect benefits the clients as well. Kammer said with the ability to generate a design more quickly, "we can view the architecture inside for a longer period of time and give the clients more quality work."

Clients also benefit in other ways. With a 3-D Revit model, they are able to see what the building will actually look like at an earlier phase; this narrows the chance that clients will become disenchanted with the design at a stage when it would cost quite a bit of time and money to make changes.

Clients can also view a variety of options more easily, allowing them to make more informed choices. **Kyle Knop**, an architect with **Eppstein Uhen**, is currently working with a client on expanding a building in De



The future is here: A section of a building being designed with Building Information Modeling software.

Pere, Wisconsin which Eppstein Uhen originally designed in traditional 2-D with architectural desktop. Knop began using Revit for the expansion's design.

When it came time for the client to choose a color for the window glass tint and frames, Knop was able to quickly show the client three different color options on his 3-D Revit model, "something Eppstein Uhen never could have offered before," he noted.

Knop said using traditional techniques of 2D modeling, he would bring small pieces of aluminum and a few small pieces of glass in different colors to give the client an idea of their choices. With Revit, he was able to create three different views of the building, each one with a different tint of glass and a different color of window frame, making the final product much easier to visualize.

Changing the colors of every window and frame in a model would have been possible before, but, said Knop, "not worth the time and headache required to do it."

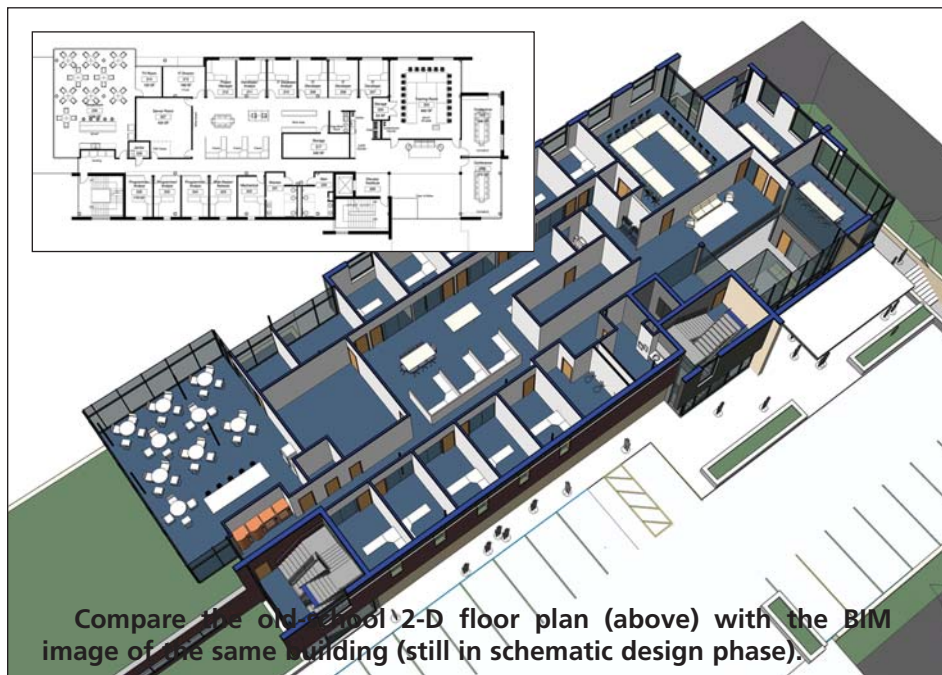
Scott Kammer has discovered a slight downside to the benefits of being able to show so much to the client at such an early stage in the process. He said that with Revit you almost have to be careful not to make the building look too finished, or "the client feels as if they don't have a say."

For Kammer, however, the benefits that Revit and BIM software like it provides to the client tend to outweigh this relatively small concern.

## TRAINING TIME

Architects using Revit and other BIM software report a learning curve is not too steep. Bret Tushaus, Director of Information Technology at Eppstein Uhen, said learning Revit involves about eight hours of self-directed tutorials and twenty hours of formal training. Kyle Knop compares learning Revit to "switching your computer mouse to your left hand. It's knowledge that you have, just a different way of using it."

Architects at Potter Lawson agreed; they have learned Revit on their own through tutorials built into the program, and from attending a Revit user's group in town where people discuss problems they're having or things they've learned about the software. The monthly meetings are led by Revit expert Tony Isenhoff, and topics are determined based on suggestions from the group. (For more information, see [masterg.com](http://masterg.com))



## BUILDING IN 5 DIMENSIONS

The real appeal of Building Information Modeling is the fact that it has appeal across industries. Tom Sweeney, with the pre-construction department at Findorff, sees the main advantage of Revit as the ability to show workers the building early on in 3-D. "We're 3-D animals by nature who have been working in 2-D for a long time," he noted.

Builders can also take advantage of what has been called the "4th dimension" made possible in some building information modeling software such as CommonPoint 4D (not, alas, in Revit) that allows schedules to be built into the design.

Sweeney and others call this the "time" dimension, and using it delivers better coordination between designers and builders, which in turn makes the whole process run more smoothly.

BIM also offers the possibility of using a 5th dimension: estimating. If things like square footage can be estimated early on, cost can be determined earlier and more accurately too.

According to Sweeney, it makes sense to use BIM even if the architects are not. Revit, for example, enables the general contractor to change the architect's 2-D designs to 3-D designs, which will give the workers a more accurate picture of what they are building. It also allows builders to estimate square footage and slice a building in a different spot than the architect may have chosen, allowing the builder to look at the cross sec-

tion they need.

Training on Revit is reportedly even easier for general contractors than it is for architects. According to Sweeney, only a handful of staff needs to be very well-versed in the software, since most workers will only need to use the very basic functions of the tool: zooming in and out, selecting and rotating views. "Things that are easy to learn."

So far, potential problems with BIM look to be few. Tushaus said he feels the "biggest challenge is overcoming the change with people who are used to the CAD tool they've used for years," while Sweeney sees the possibility of legal issues arising. "Once everyone is working closely together – collaborating more because of the software – it will be difficult to know who to blame if something goes wrong."

Generally speaking, the reviews are in and they're positive. While there are not many firms in the area currently using this new building concept across the board, everyone interviewed seemed to believe that in the future, most architects and builders will completely switch over to some sort of BIM technology.

Sweeney said he watches his kids playing video games and he wishes the elaborate 3-D renderings and life-like images could be created for use in the construction world.

Revit and other BIM tools are bringing him closer to that desire – bringing to mind a fitting quote by the science fiction writer William Gibson: "The future is here. It's just not widely distributed yet."