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From the San Antonio Business Journal:  
<http://www.bizjournals.com/sanantonio/print-edition/2013/02/01/building-performance-now-in-3d.html>

Commercial Real Estate

# Building Performance: Now in 3D

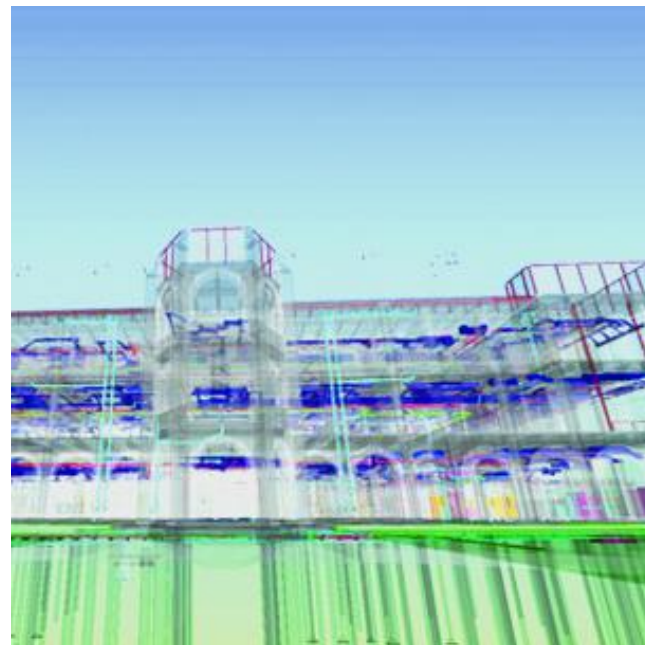
Nevermind that old spreadsheet. BIM technology and 4D models are today's tools for building owners and managers.

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Feb 1, 2013, 5:00am CST **Updated: Jan 31, 2013, 11:03pm CST**

**Texas A&M University** - San Antonio might be one of the newest members of the local higher education scene, but it is pioneering a technological process that is changing the future of building maintenance.

At the same time as three campus buildings are under construction, files containing computerized 3D models of each structure — handed over by the general contractor — are being imported into the university's database. What's



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more, each file is updated regularly with the most miniscule of details about each structure — from design plans to construction materials and even information to order replacement hardware such as light switches and door handles.

Top: Texas A&M-San Antonio's multi-purpose building. Above: One snapshot of the BIM digital file of the same Texas A&M building. The BIM snapshot was created by Luis Berumen of Bartlett Cocke General Contractors. Right: Marshall Lasswell, director of Facilities and Physical Plant at Texas A&M University-San Antonio, says he and his staff soon will use the BIM files to manage the building's data, operations and maintenance.

The benefit: Building managers and physical plant workers — charged with overseeing day-to-day operations — will have comprehensive information at their fingertips.

“Our hope is that when technicians are out in the field, and they need to look up operation and maintenance manuals, the work orders will have embedded links that provide a pathway to PDFs, the specifics on a piece,” says Marshall Lasswell, director of Facilities and Physical Plant at Texas A & M University-San Antonio.

The information trail begins in the design process, with technology called Building Information Modeling, or BIM. In addition to capturing critical design information, the software also allows designers, contractors, sub-contractors, and clients to view a room or structure before it's been built, thus averting major mistakes and the added costs of correcting them.

## Progress

The technology for 3D modeling isn't new to the architecture and construction industries. However, as the BIM systems have become more commonplace, their usefulness has become more diversified.

Now, end users such as building owners, managers and physical plant engineers are able to create a one-stop-shop database for brick-and-mortar assets.

Instant access to such complete information is a game changer.

“For example, if we had a water leak in a pipe, and we had to find and isolate the valve to cut the water off — we’d have that information available immediately,” Lasswell says.

Details on equipment — such as model and serial numbers, warranty information, user manuals, and product specifications — also are entered into the system. This eliminates disparate file folders and lost account numbers.

Texas A&M-San Antonio’s 90,000-square-foot, multi-purpose building, completed about 18 months ago, was a recent pilot project for the BIM database.

Information on the overall design of the building was imported into the facility management software and can be easily accessed.

“The time it will save our folks to maintain and operate the facility year after year far outweighs the minimal cost to design and construct using BIM,” adds Lasswell.

Out with the old

Texas A&M might be one of the rare end users of BIM in San Antonio, but the use of Building Information Modeling in the architecture and construction industries now is considered best practice.

In fact, long gone are the standard processes of building design — such as placing sketches on a light table to see if all the elevation lines match and aren’t running into one another.

In 2010, Joeris General Contractors Ltd. hired Andy Gajbhiye to manage its BIM projects, and it didn’t take long for the company to see results.

“My second project was the Health Science & Engineering Facility at **Trinity University**. The project had so much MEP (mechanical, engineering, and plumbing) coordination, we saved half a million dollars on that job because of the BIM.”

Thanks to 3D images provided by BIM, Gajbhiye and designers were able to visualize the project and fix design flaws before construction ever began.

Luis Berumen, BIM manager with Bartlett Cocke General Contractors, says 50 percent to 60 percent of the company's projects use BIM.

"I'm predicting all of our projects will be BIM by 2015," adds Berumen.

Much like practice footage helps players and coaches before a football game, BIM allows contractors, architects, engineers and project managers to see how their plans come together — and time to fix the weak spots.

"With BIM, we assemble models together and click a button to find interference," says Berumen. "We've achieved savings on every project which is transferred to the client and can be incorporated back into the project for facility enhancements."

Berumen estimates that BIM helped save at least \$150,000 on a local higher-ed project when a design flaw involving the facility's mechanical room was caught early.

Not everyone is convinced BIM soon will be universally adopted by building owners and managers.

"Until there's an easy interface, there's no value to the end user," says Jack Carson, president of Carson Design Associates, who has offices in San Antonio, Austin and Indiana.

BIM software is costly for companies to purchase and load onto their computers, Carson says. Better technology is evolving through cloud computing, which allows clients to access the 3D designs through a web browser or mobile application.

Cloud-based applications will allow for real-time synchronization of data — meaning when a new valve is replaced, and the plumber enters the

manufacturer's code — the building owner will automatically see the update.

"It's how we'll interface with clients," says Carson.

Forward thinking

Still, the possibilities and uses for BIM are endless. Landlords can track space management. Building managers can study HVAC system efficiency. And companies in highly regulated industries can maintain better records.

In the health care industry, for example, BIM is used to keep track of maintenance and inspection records on critical medical equipment, generators, even fire extinguishers.

"Using an iPad, hospitals can scan an object that has an aluminum bar code on it and pull up all the info on it," says Berumen.

For companies that office in renovated historical buildings, owning the BIM software allows for quick identification of uncommon materials.

"We'll scan the entire room so if there's anything historical, even a door handle, the client will have that information," says Joeris' Gajbhiye.

As the future of 3D and cloud-based technology broadens, the knowledge is being infused into curriculum at the University of Texas San Antonio.

A BIM class currently is offered to architecture and construction students.

"We realize the importance of preparing our students with the new trends and technologies," says Dr. Rui Liu, an assistant professor at UTSA's Construction Science and Management Program.

Next year, the course will no longer be an elective, but a required class for all construction majors.

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*San Antonio Business Journal*