

THE ABC'S OF BUILDING INFORMATION MODELING

Construction approach increases return on investment for developers, owners and municipalities.

By Eric Harvey

Whether developing from the ground up or looking to add value, integrated building information modeling (BIM) provides returns at every stage of the building life cycle. Return on investment is achieved through design and construction cost reductions, lower facility operation and maintenance costs, and improved space utilization, leasing and marketing tools.



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cost savings, according to *Construction Dive*. The percentage of costs to be saved by utilizing an integrated BIM approach here in the Midwest hasn't been studied, but those employing the technology understand its value.

Ryan Gallmeyer, vice president of production operations for Buckingham Cos., states that "although difficult to quantify, the ability to coordinate and detect design issues in an integrated digital model reduces questions and conflicts in the field during construction, resulting in fewer change orders."

Utilizing artificial intelligence applications, integrated BIM models are compared against daily construction practices to identify mistakes and safety issues in the field. In the future, developers will submit BIM data to regulatory agencies to validate plans for compliance with codes and regulations like the International Building Code.

Code compliance could also be checked throughout the design process to reduce errors that would be costly to correct later. BIM models could even be submitted for LEED certifications, or to obtain releases and permits.

Lower operations costs

On average, it takes 1.7 hours to find information related to work orders, while a fully populated com-

ponent-level inventory will reduce that time to five to 10 minutes, saving thousands of hours, according to *The BIM Hub*. Component-level inventory is an inventory that includes almost all equipment within the building envelope and site boundaries.

According to a study by the U.S. National Institute of Standards and Technology, 23 cents per square foot per facility is wasted each year "looking for, validating and/or recreating facility information that should be readily available."

An integrated BIM approach allows for data collection on every space in a building, including every piece of equipment, warranty and operation and service manual. The data generated can be stored in one database to be referenced by owners and facilities management staff.

BIM data can be captured in the Construction-Operations Building Information Exchange (COBie) format and imported directly into computerized maintenance and management systems used to manage facilities, according to *Whole Building Design Guide*.

Improved space utilization

Seeing is believing when it comes to interior space design. "Creating images for interior design must be quick, easy and expressive. Lighting, materials, finishes and fixtures all play a

role in the visualization process. BIM allows for this level of detail — even in the early conceptual modeling stages," states a report from Autodesk Inc., a design, engineering and entertainment software provider.

BIM is the first step in providing tenants with a 3D animated or augmented virtual tour. Leasing and sales representatives need access to every tool available to secure more tenants at higher rates. BIM provides those opportunities.

Additional opportunities are created for developers and owners to save upfront build-out and staging costs for speculative space, and instead provide augmented reality tours to prospective tenants. Having all data readily available further reduces the time necessary to create tenant improvement plans and remodel plans.

BIM strategy

The full value of BIM is realized on new development projects, but existing facilities gain substantial cost savings by gathering BIM data over a short period of time. When thinking about new projects, the development team and owner need to address three questions.

1. Who in the organization will use the BIM data, and are they represented in the BIM discussion?
2. What data does each stakeholder need to collect?
3. Who will maintain the data?

Once these questions are answered, the responsibility to collect data must be contractually assigned to project architects, engineers and contractors.

For existing facilities, the capture of COBie data for an entire campus may be accomplished in 12 to 24 months simply by modifying service and work orders, according to previously cited sources.

Collect just five pieces of building equipment and systems information: make model, description, serial number and asset identification number, according to Autodesk. From there, the COBie database can be expanded to include space dimensions or whatever else is most valuable to your management team.

Implementing an integrated BIM strategy offers return on investment at every stage of the building life-cycle. Efficiencies gained in design, construction, operation and leasing provide cost reductions leading to higher returns, which lead to higher valuations that developers and owners can't afford to ignore. ■

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Contractors such as McCarthy Building Cos. use techniques such as prefabrication to accelerate the construction process. Pictured is Mercy Hospital Joplin, an 890,000-square-foot hospital in Joplin, Missouri, that McCarthy constructed in 46 months.