



Who's Minding the Store?

BIM Is.

Experts agree that Building Information Modeling (BIM) will be the standard methodology for the built environment in the future. "When?" is a more difficult question to answer and depends on the industry. As the early adopters establish BIM's ability to lower facility costs and increase profit margins their competitors will be chasing the BIM bandwagon.

The key motivations for working in BIM are different depending on the

"BIM will change forever the way we design, engineer, construct, maintain, and ultimately demolish commercial structures."
Frank Gehry

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industry. For the automotive industry, BIM's greatest advantage is that it facilitates the integration of the process and the building, allowing them to adapt to changes in process more efficiently. For healthcare, where the operations are more consistent, the important issues include precise application of standards and procedures. For large retail chains,

where profit margins are tiny, BIM enables multiple ways to maximize those profits. This paper will focus on the retail sector. To start it is important to clarify what BIM is and what makes it different from other powerful design applications.

What is Building Information Modeling?

First of all, BIM is not a piece of software; it is a methodology that is enabled by software. BIM is a comprehensive virtual index of all information related to a building project. Think of a sophisticated 3D CAD model that is linked to multiple layers of different types of information. The information is in the form of object properties, object-oriented graphic components, database entries, specifications, costs, and drawings as well as schedules, contracts, warranties, maintenance information

and other documents. BIM creates relationships between data related to design, construction, maintenance and operations.

BIM is the ultimate tool for collaborative work within project teams and between clients and their resources. Architects, engineers, contractors, project managers, owners, and



facilities managers associated with a project are among those who typically add data and access the data in real time.

The Power of Automatic Updating

Design and documentation can be done concurrently instead of sequentially. Why? Because whenever a change is made in one aspect of the project, it is immediately captured and becomes part of BIM's integrated digital environment. For example, if the architect decides to change a building's stone entrance to a wood entrance, this decision triggers a universal change in documentation as it relates to material take-off, finish schedules and specifications while potentially affecting project cost and project schedule in a positive or negative outcome.

Probably the most visually exciting feature of BIM is the virtual building that it creates. While 3D CAD is capable of creating a model that a viewer can walk through, it has limitations. In BIM the walk-through occurs in real time. With the proper software, a user can pause at any point and click on an object to access all the data associated with it. Virtual buildings allow users to experience intangible properties, such as light levels and shadows.

BIM Revolutionizes Retail

Large retail chains are beginning to adopt BIM as the tool for everything from developing the prototype for their stores to managing inventory and tracking buying behavior. There are a number of characteristics of retail chains that make them ideally suited for working in BIM.



Designing the Store

The interiors of retail stores are carefully designed to create a specific shopping experience. The orientation of the departments within the entire store and the placement of stock on the shelves and displays are anything but arbitrary. That's true for almost any type of retail facility whether they sell swim suits, produce or books.

With BIM's virtual 3D modeling capability the retail client can modify any aspect of the building in the design phase with minimal cost, time or effort. Working with the client's specifications for furnishings, the architect can populate the model with the exact shelves and racks, signage, displays, lighting – any object that will be included in the completed store. The retailer can then mimic the shopper's experience by taking a virtual walk through. In the near future, retailers will be able to experiment with certain aesthetic elements on their own such as the affect of changing the interior finishes as they "tour" a department.

Time and Cost Savings

Regardless of the number, BIM changes are less likely to compromise the accuracy of the project documents or cause a communications nightmare.

BIM's value over the life cycle of a building is as impressive as its agility in real time.

BIM Has the Answer

Any member of the project team can find out when that wood was ordered by doing a quick search of the data. If he wants to find all the documents related to that change from stone to wood, he can perform a search that will yield a filtered list of documents, drawings, even emails.

BIM's value over the life cycle of a building is as impressive as its agility in real time. Years after the project is complete, the facilities maintenance staff can call up the digital model, click on the water heater, for example, and obtain its model number, the date of installation, the warranty, the next scheduled maintenance and any other information related to that object. Without BIM, that information might exist only in paper form in dusty file folders in an offsite storage facility.

- They replicate facilities in multiple locations.
- The prototype facility is often modified for local conditions.
- The speed in which a new store can be opened has a significant impact on profits.
- They need to track and manage inventory for quick changes.
- They rely on coordinating information arising out of several locations: distribution centers, multiple store locations, and corporate headquarters.
- Small profit margins drive the need to manage the facilities aspect as efficiently as possible.
- The layout and design of the interiors is critical to influencing consumer behavior and generating sales .



When BIM is used, the ability to explore options during the conceptual design phase reduces the likelihood that there will be expensive, time consuming change orders after construction is underway which in turns increases the project cost.

Without 3D modeling, the only way to simulate the shoppers experience and evaluate the flow and aesthetics of the store is to build a physical mockup. In that scenario, evaluating a different paint color is not a trivial exercise. In addition to the obvious savings associated with eliminating this step, there are other potential savings -- there is no need to own or lease the space for constructing the mock-up. Then too, deleting a mock-up from the project schedule compresses the design phase which accelerates the start of business.

Accuracy Saves Money

In traditional design methods, speed is often the enemy of quality. With BIM the opposite holds true. The time saved by performing many tasks electronically can be applied to more creative ones. Because all parties can access comprehensive real time information in electronic format, communication is less time consuming and more accurate. Greater automation means less chance of human error.

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Consider how this affects ordering building materials. The amount of material required is automatically calculated based on up-to-date plans and the orders can be generated electronically. This increases the chance that the correct quantity of each material will arrive on time. Ordering can occur earlier in the design process and with that comes the potential for dodging a price increase.

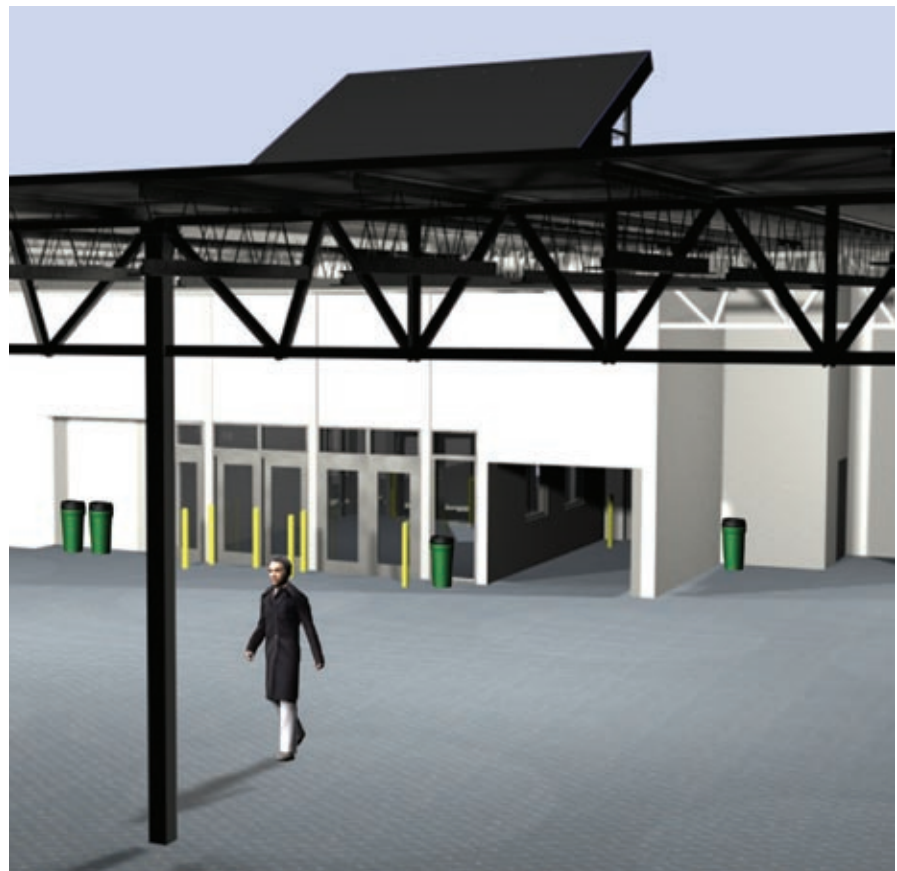
Flexibility and Adaptability of the Design

Let's imagine that the design "on the boards" is a prototype for a national chain of grocery stores. The owner knows that certain variables are likely to occur from store to store depending on location. For example, subsequent stores may have unique entrances that vary with the orientation of the site. The architect can plan for these variables ahead of time and set up the design so that the entrance is

its own module. That module can be easily changed out for a different entrance design in a fraction of the time of traditional design programs.

The gains discussed here focus mostly on the design phase. BIM provides equally unique advantages to the operational side of the retail business. For example, retailers can track sales volumes of an item as they relate to how they are displayed – top shelf, bottom shelf, point of purchase. They can calculate how much shelf space is needed for seasonal items and actually see various options for where they could be placed.

As with many breakthrough technologies, once users understand BIM and apply its capabilities, they will find it indispensable.

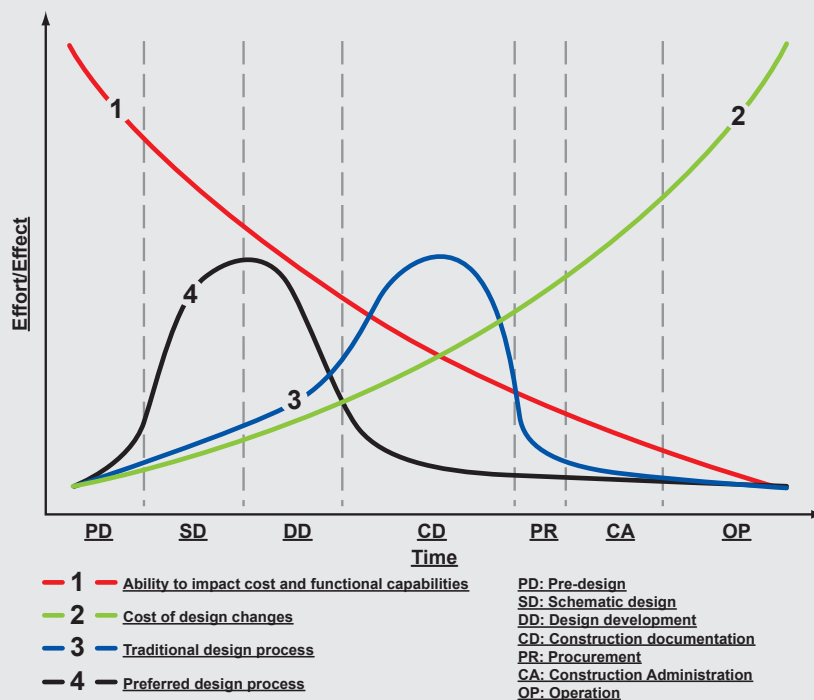


How BIM Saves Money for Retail Clients

- Eliminates need for mockup
- Easy to evaluate options in design phase – reduces costly redos during construction
- Automated records/information reduces errors
- Communications take less time
- Modular design makes it easier to modify prototypes
- Eliminates time-consuming digging for product information
- Ordering materials is faster and more accurate

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BIM: the influence on process



In the traditional design process, the greatest effort and effect occur during construction documentation when the cost of making changes is on the upswing and the ability to impact cost is reduced.

In the preferred design process (BIM enabled) effort and effect peak when there is less cost to make changes and the ability to impact cost is high.

Images courtesy of Bentley Systems, CURT, and Patrick MacLeamy

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