

New paradigm prevents major problems

BY MICHAEL LAURIE

In the building trade any deficiency in communication, lack of cooperative and strategic scheduling, or shortage of synchronized planning and execution can create significant problems. All too often, missteps and oversights translate into frustrating setbacks for owners, architects, engineers, builders, and fabricators. Everyone in the industry eventually discovers – often in the wake of a mistake that costs them dearly – how a simple breakdown in data coordination and precise information sharing can be problematic.

But miscommunication and lack of informed vision also has the proven potential to rapidly accelerate in complexity and snowball into a major dilemma.

Any decision maker, investor, or contracted professional in the business routinely runs the risk of being implicated in serious issues and embroiled in irreversible predicaments. Small errors and inaccuracies can magnify exponentially – until they have the potential to sap resources, undermine profits, invite lawsuits, and wreak general havoc.

Recognizing the need for a more proactive way to address this kind of quandary and risk, the industry has recently embraced sophisticated, high-tech Building Information Modeling (BIM) technology.

Today BIM represents the way of the future as it pioneers revolutionary tools and resources to offer quick and affordable solutions to problems that have perennially plagued the building industry.

Exploring the Potential of a New Paradigm
But BIM capability does not just minimize risk and troubleshoot problems. Perhaps more importantly, it radically optimizes efficiency, creativity, innovation, and sustainable profitability.

Of course technological advances are not new to the industry. AutoCAD or similar software products already in widespread use are able to display and represent data, for example, in a unique format that can be conveniently analyzed and shared with interested parties.

Shortcomings are evident whenever there

is the critical need for an interactive system capable of integrating updates and real-time changes to design and construction plans. Practically speaking, that happens on a daily (if not hourly) basis. Without that next generation level of technological evolution, even the most advanced software on the market becomes obsolete in terms of providing pragmatic insight or visionary foresight that can keep pace with the dynamic projects and demands of today's building industry.

BIM, on the other hand, delivers an unprecedented platform that promises to shift the entire modeling software paradigm dramatically and progressively forward. The ingenious software is not just multi-layered and multi-faceted, but it also exhibits an innovative agility and imaginative flexibility for intelligent multi-tasking across diverse applications.

Plus, the underlying fundamental data is more reliable and accurate because errors related to transference of field drawings to laptops, unwanted changes in scaling when plans are photocopied, and discrepancies between blueprints and "as-builts" do not factor into this superior modeling process.

BIM additionally offers complete life cycle management capability, for example, which reduces time, labour, and overhead while it facilitates the organization and sharing of data, maximizes returns on investment, and minimizes liability.

Occupancy reports can be automatically updated, changes to floor plans or building features and amenities can be seamlessly incorporated, and detailed product information – from technical specifications to warranties and maintenance manuals – can be integrated into the database for easy access.

Managers can refresh plans and consolidate data from multiple sources, without requiring assistance from architects. They can email comprehensive BIM plans back and forth to architects or share them with government permitting agencies, fire departments, appraisers, and insurance companies. They can also customize the digital BIM resources and upload them to the Internet to create

virtual building tours for marketing purposes.

The Practical Implications of Parametric Possibility

Because parametric BIM modeling now allows experimentation, alteration, and trial and error, its introduction opens a new frontier of possibility. Try various layouts and configurations, change the thickness of walls, move windows, or upgrade insulation. Adjust the lighting or the R-value of a space and then monitor the thermal effects of sunlight over a specific period of time, while also factoring in local weather patterns. See infinite possibilities while limited only by the imagination, without risking a dime or committing any resources to actual bricks and mortar. Without the advantage of BIM insight many mistakes can and do happen, and they can be annoying or elevated to the level of an outright catastrophe. Unfortunately for the industry, awareness of that fact naturally limits innovation and stifles the creative impulse.

But fear of unknown contingencies is entirely understandable and justifiable. Make a mistake while re-skinning a high rise tower by adding insulated cladding to the exterior and it can make residents uncomfortable – or perhaps destroy the whole building. The R-value may be boosted to cut utility bills, and in the process it makes apartments too warm or inhibits the building's ability to "breathe" as it should. Changes gone badly awry can even generate so much pressure and trapped moisture behind the cladding that a virtual rainstorm ensues in the upper floors of the structure. Soon water permeates the building, saturating the project with liability and red ink.

But BIM models allow the user to test, calibrate, analyze, and foresee outcomes like these before ideas leave the drawing board. Move a window or doorway in front of a structural wall or plumbing pipe and it shows up on the BIM model, offering the same perspective and view that one gets when walking through a real building. The effects are visual, realistic, and immediate.

When changes are made in elevation, for instance, those must be reflected in planning

and scheduling and other related areas. But as soon as an adjustment is made in one part of the BIM model, the implications are visible throughout and changes are made everywhere else. All data and drawing information is associated and linked, virtually ensuring flawless coordination in the design and construction phase.

BIM Redefines Value-Added Benefits

Upon completion of the BIM modeled building, the owner inherits what amounts to an entire encyclopedia of information that is all stored in one single and easy to navigate file. The BIM model can then help owners and property managers perform an array of critically important tasks for the lifetime of the building. It can generate budgets and revenue projections, manage rentable space, and repurpose information into dynamic marketing tools.

While the workflow may be different for those accustomed to other programs like AutoCAD, the operation of BIM modeling software is intuitive and easy. Projects are typically delivered faster, more economically, and with greater potential for reduced environmental impact – a feature that is becoming more essential as green construction practices gain momentum and encourage changes in legislation and mandatory policies and building codes.

An investment in BIM modeling is an investment in both the present and the future, and is arguably the best bargain in the business in terms of the potential protection it buys. Fortunately, implementation of BIM modeling can be accomplished at a price that is a mere pittance compared to overall project costs. Meanwhile a host of BIM value-added benefits ensure sustained returns that far outweigh the initial cost and either preserve or generate revenues in a variety of different ways – including the enhanced opportunity for truly visionary ventures.

For further information on building measuring technologies, including BIM modeling, please contact Mississauga's

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