The Five Fallacies of BIM

This white paper examines the most common misconceptions about BIM; what they are and why they aren't true. For firms considering a move to building information modeling, the paper provides background on common concerns surrounding BIM and draws on the experiences of Revit platform users to evaluate these "BIM fallacies".

"We'll loose hundreds of billable manhours while we transition to BIM." "Using a building information model is risky and only benefits the owners." "BIM is too complicated for a small firm like ours to implement." "We'll lose money on our first few BIM projects—money we can't afford to lose."

These types of concerns often surface when a firm is considering the move to building information modeling. But how big should these concerns really be?

Five Fallacies Surrounding BIM

Here are five of the biggest misconceptions regarding BIM:

1. Productivity suffers during the transition to BIM.

2. BIM applications are difficult to learn.

3. BIM disrupts established workflows.

4. Owners and contractors benefit most from BIM—not the designer.

5. BIM increases risk.

Sentiments like these or slight variations of them cause unneeded, unproductive anxiety for those within the building industry who are considering the move to BIM and potentially forestall or derail a successful transition. Don't take these complaints at face value—they shouldn't impede the transition to BIM, as evidenced by the experiences of Revit platform users who have successfully overcome these perceived obstacles.

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1st Fallacy of BIM – Productivity

Most firms assume that if they implement a BIM solution, they'll experience productivity losses during the transition period. Indeed, a Revit platform implementation web survey conducted by Autodesk cited an average productivity loss of 25–50% during the initial training period on Revit-based applications.

But the reality is that any initial productivity losses during training get quickly wiped away by productivity gains. In that same web survey, it took most respondents just 3–4 months to achieve the same level of productivity using Revit-based applications as with the previous design tool and once they were over the initial training slump, more than half the respondents experienced productivity gains of over 50%. Close to 20% experienced productivity gains of over 100%.

A BIM solution such as the Revit platform is based on the use of coordinated, consistent, computable information about a building project. Firms are able to save time by avoiding the manual creation and coordination of documents—allowing them to generate project documentation faster and more accurately.

For example, Lott + Barber Architects (*www.lottbarber.com*) an architectural and planning firm based in Savannah, Georgia began using Revit® Architecture software in 2004 and now use it for all new projects. To quantify their productivity gains, they compared the time spent on different stages of the design process for two projects of similar size and scope—using Revit Architecture versus traditional CAD tools. As can be seen from the table below, they experienced productivity boosts across all major segments of the design process and particularly in their construction documentation process.

Task	CAD (hours)	BIM (hours)	Hours saved	Time savings
Schematic design	190	90	100	53%
Design development	436	220	216	50%
Construction documents	1023	815	208	20%
Checking and coordination	175	16	159	91%
Totals:	1,824	1,141	683	

Figure 1:

BIM enables Lott + Barber to save time and increase productivity by avoiding the manual creation and coordination of documents.

Another example of a firm that has experienced significant productivity gains from using BIM is Walter P. Moore (*www.walterpmoore.com*), a leading U.S. consulting engineering firm headquartered in Houston, Texas. Because their construction documents are created directly from their Revit® Structure models, they spend a lot less time producing documentation and a lot more time on modeling the structure. In addition, the parametric change engine at the heart of the Revit platform automatically coordinates changes and maintains consistency at all times. So when the model is changed, all affected views, drawings and schedules are instantly synchronized.

Revit Structure software also offers an integrated design and analysis environment. As the physical design model is created, an analysis model is automatically created and kept in sync with the design model and the documentation—increasing productivity by avoiding duplication of effort and manual coordination. By focusing on the accuracy of the building information model, the designers and engineers at Walter P. Moore improve both the quality of their design as well as the quality of their drawing deliverables.
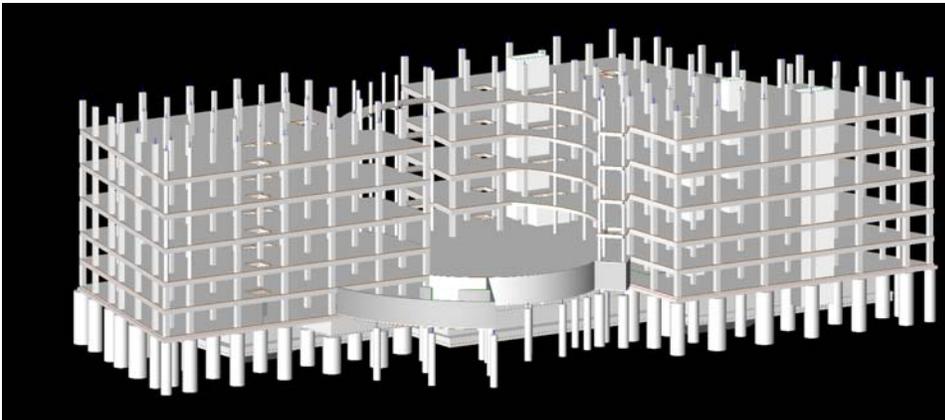

Figure 2:

Walter P. Moore uses Revit Structure software to increase productivity, avoiding duplication of effort and manual coordination.

2nd Fallacy of BIM – Accessibility

Anxiety concerning loss of productivity is accentuated by fears about how long it will take designers—who are so familiar and comfortable with existing CAD tools—to transition to a BIM solution.

In reality, purpose-built BIM solutions are created specifically for the design disciplines they serve. The Revit platform, for example, is built specifically as a tool for thinking about buildings, and behaves the way a building designer would expect. As a result, for a design professional, a software solution like Revit Architecture can be easier to understand than more general CAD or modeling applications.

Martinez + Cutri Corporation (*www.mc-architects.com*) is a San Diego-based firm using Revit Architecture software to deliver architectural, interior, and urban design and planning services. The firm began implementing Revit Architecture in 2003 by training three people at a time, in two-week sessions. In week one, they would learn the basics of the software, and by week two they would already be working on a real project. Their experiences mirror those of many other Revit Architecture users who have gone straight into production with the software after a very brief training period.

Figure 3:

With little more than a week's worth of training, designers at Martinez + Cutri started using Revit Architecture software in production.

Another example of a customer whose designers quickly transitioned to BIM is GASAI, *Graef, Anhalt, Schloemer & Associates* (*www.gasai.com*), one of the leading engineering consulting firms in the United States. With offices throughout the country, GASAI has been using Revit Structure software since it was first released in 2005. On their very first project, the project team spent about two days coming up to speed on the new software, using self-paced tutorials and viewing product webcasts—enough to understand the basics of the product. After that short amount of training, their structural engineering technicians started in on the project, completing most of it in just three days—an assignment that normally would have taken them three weeks.
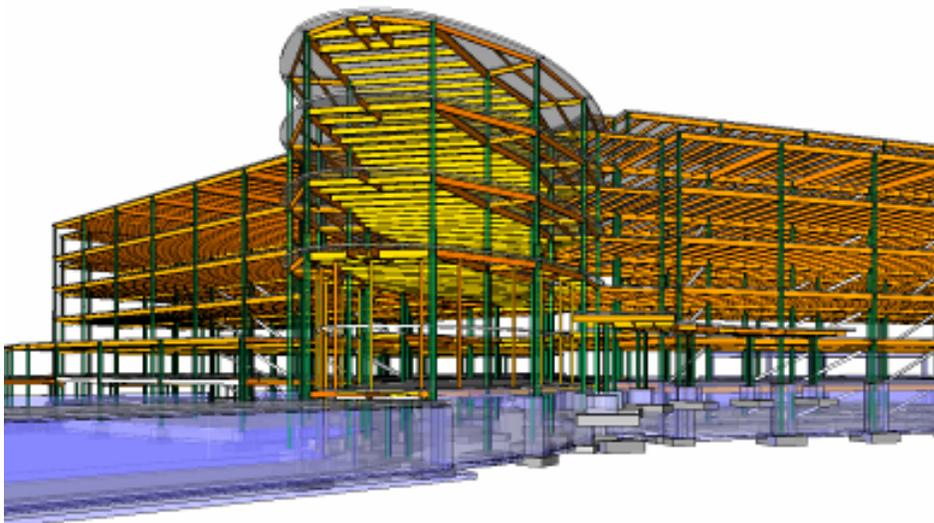

Figure 4:

A purpose-made BIM solution like Revit Structure can be easier to learn than more general CAD or modeling applications, allowing firms like Graef, Anhalt, Schloemer & Associates to start using the software in production almost immediately.

3rd Fallacy of BIM – Workflows

There are two dimensions to the concept of "workflow": the *progress* of an activity as it moves through a company, as well as the *rate* at which this progress takes place. Does BIM affect workflows?

Absolutely, BIM affects workflows—the progress as well as the rate. But the reality is that the workflows it disrupts are inefficient ones, workflows that a firm is probably seeking to change if it is looking at BIM. In a Revit platform implementation web survey conducted by Autodesk, 82% of the respondents noted their design process was changing as a result of using the Revit platform, and once they were past the training period more than one-half the respondents experienced productivity gains of more than 50% due to those enhanced processes. Clearly BIM does affect workflows—and for the better—so firms should look forward to, not fear, the workflow changes caused by BIM.

Figure 5:

Glotman-Simpson have found that the workflow between their designers and drafters has changed for the better, resulting in more informed design decision making and therefore better designs—such as this mixed-use tower slated for construction in San Diego.

Glotman-Simpson (*www.glotmansimpson.com*) is a Vancouver-based structural engineering firm that has been using Revit Structure software since 2005. For this firm, enhanced collaboration workflows are blurring the distinction between the functions of the designer and the drafter and allowing them to produce more tightly coordinated designs.

For instance, the designers used to rely on the drafter to cut sections or produce details so they could look more closely at the design in a particular area. Now their designers can manipulate the building information model directly to investigate and visualize complex conditions. In addition, the drafters can focus more on how things are built instead of having to be concerned with drafting conventions and drawing production. Everyone can focus more on the intricacies of the structure itself, resulting in a better building.

4th Fallacy of BIM – Value

Who benefits from BIM? Is it the designer (be it an architectural, structural or engineering firm) that reaps the benefit? Or is most of the value of BIM realized 'downstream' by contractors and owners?

The answer is that both benefit. By reducing the duplicated efforts of conventional drafting and coordination methods, BIM allows the designer to focus more on high-value design, understand more about the design earlier through analysis and visualization, and deliver as much value to the owner as possible. The client gets better use of resources on the project and a more predictable outcome. The contractor gets higher-quality, more complete construction documents, making for a smoother, more predicable project delivery.

Figure 6:

RTKL use BIM on projects (such as the hospital shown here) to improve their own quality and efficiency, and provide downstream value to their clients and their clients contractors.

RTKL is a global architecture, engineering, and planning firm with offices around the world. The firm began using Revit Architecture software in 2003, and subsequently implemented both Revit Structure and Revit® MEP software—utilizing the Revit platform and building information model for early informed design decision-making and coordination with their clients and their builders.

For example, RTKL used the Revit platform on a recent hospital project. Throughout design and pricing, the building information model was used in real time during owner meetings, enabling RTKL to work directly with its clients and providing them with immediate visual references of the spaces they desired. Design changes automatically rippled through to all affected drawings, allowing RTKL to complete an already tight schedule and overcome a severe staff shortage during the production phase. In addition, the building information model was used to provide the contractor a superior set of construction documents with more details to describe the complex building geometry— which resulted in better pricing and execution during construction.

5th Fallacy of BIM – Risk

Let's face facts. Buildings are commissioned, designed, and built by humans—so human errors are inevitable. And mistakes or misunderstandings can be expensive and aggravating. But does sharing a building information model increase the chances of mistakes and misunderstandings? Does it increase a designer's risk of errors?

Not necessarily. BIM provides a way to reduce the risk of errors occurring in the design process. By extending coordination across the entire design team, even across disciplines in some workflows, a purpose-built BIM solution like the Revit platform can increase the likelihood that human errors will be caught and corrected during the design process. With automatic document coordination and with clearer project communication based on consistent, computable information about a building project, BIM improves design decision making, predicting performance, cost-estimating and construction planning.

In addition, nobody requires that a firm share the building information model if they are not comfortable doing that. Sharing a building information model is not a requirement to benefit from BIM. For teams who are willing to collaborate that closely, sharing building information models can make BIM even more effective—but that choice is left entirely to the project team members.

Figure 7:

On projects like this inner-city rehab, Donald Powers Architects has experienced a 50% drop in requests for information during construction.

Donald Powers Architects is a design firm based in Rhode Island, whose staff of architects and urban designers work on projects of varying size: town plans and urban designs, commercial and institutional buildings, even multifamily and single-family residences. To deliver quality design and enhance communication, the firm has standardized on Revit Architecture software.

With more than 20 projects completed using the Revit platform, they've experienced significant productivity gains internally: 30% during design and documentation. In addition, they've also experienced a 50% drop in requests for information during construction. By using a building information model, inconsistencies are either avoided altogether or identified and resolved early in the design process—before they creep into the documentation set and end up as potentially serious RFIs during construction.

Five Facts about BIM

We have been used to thinking about how CAD impacts the design process for so long, that it can be difficult to wrap our heads around a paradigm shift like BIM. No doubt many of the misconceptions about BIM are rooted in CAD experiences, and also in the reluctance to move out of a comfort zone—inefficient and error-prone as it may be.

But BIM is a revolutionary new way of working—a new way of designing. It requires one to think about things differently. Start by throwing away those five fallacies of BIM and replace them with these five facts about BIM:

1. Productivity improves with BIM, allowing firms to accomplish much more work with the same resources.

2. BIM is easy to learn, because purpose-built BIM solutions work the way architects and engineers think.

3. BIM improves good workflows and helps retool inefficient ones.

4. Everyone benefits from BIM—the owner, the contractor AND the designer.

5. BIM provides a way to reduce the risk of design errors, enabling easy communication and coordination across the project team.

"We see Revit as a way to do what we do in a more in-depth and efficient way. Creating higher-quality architecture gives us a competitive advantage in the marketplace," states Douglas Palladino, Principal at RTKL. Embrace the changes that BIM offers and the results will be worth it.

About Revit

The Revit platform is Autodesk's purpose-built solution for building information modeling. Applications such as Revit Architecture, Revit Structure, and Revit MEP built on the Revit platform are complete, discipline-specific building design and documentation systems supporting all phases of design and construction documentation. From conceptual studies through the most detailed construction drawings and schedules, applications built on the Revit platform help provide immediate competitive advantage, better coordination, and quality, and can contribute to higher profitability for architects and the rest of the building team.

At the heart of the Revit platform is the Revit parametric change engine, which automatically coordinates changes made anywhere — in model views or drawing sheets, schedules, sections, plans… you name it.

For more information about building information modeling please visit us at *http://www.autodesk.com/bim*. For more information about Revit and the discipline-specific applications built on Revit please visit us at *http://www.autodesk.com/revit*.

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