

Emerging Technologies

*ASSA ABLOY Openings Studio – Innovative
Opening Solutions for BIM and Beyond*

ASSA ABLOY

The global leader in
door opening solutions



BIM. Good Grief.

Denial, Anger, Bargaining, Depression, and Acceptance. You may recognize these terms as the “5 Phases” of a grieving process, but they could easily describe the phases one goes through before adopting any new or emerging innovation or technology. Do any of the following sound familiar regarding your perception of Building Information Modeling (BIM)?

- BIM is not used on projects in my market.
- There are no requirements for BIM in my contract or scope of work.
- I don't like the transparency with BIM. Mystery can be profitable.
- BIM means more work with no guarantee of an order.
- I can remove BIM requirements from my contract.
- How will I afford the investment in new technology and skill sets?
- BIM will be the death of distribution. Contractors will buy direct.
- BIM can add value to my process.
- BIM is an opportunity to increase business.

Some may find acceptance elusive and many distributors are wondering just how and where they will bring value to BIM design and construction. As a comparison, go back a few years to when the “Green and Sustainability” movement first began. You may recall acceptance of this emerging trend was tempered with a healthy dose of skepticism by both manufacturers and distribution. Today, sustainable products and practices are commonly reflected in building codes and increasingly demanded by owners to be included in standards and facilities.

It's not just BIM. There are a number of emerging and interrelated trends bringing significant changes to the AEC industry. Integrated Project Delivery (IPD) is a relatively new construction delivery method that fosters a shared risk/reward alliance among owners, designers, builders, and suppliers. Sustainable construction now encompasses standards related to high performance building design (energy efficiency) and environmental and health product declaration documents. Maybe the most impactful change will be the shift toward lean construction practices and the renewed interest in modularization, prefabrication and pre-installed hardware openings as cost saving alternatives.

Arguably, BIM is the fuel behind the accelerated growth of these worldwide construction trends. Visualization, information, and collaboration bring greater clarity and efficiency to IPD, high performance benchmarking, and lean methodology and waste reducing practices.

BIM is not just for architects. The concept behind BIM is not new and 3D modeling goes back 30 years or more. Building Information Modeling as a design term gained popularity in the mid-2000 decade coinciding with advancements in 3D technology and computer processing. Today nearly 70 percent of design and engineering practices are using some form of BIM design software. Equally impressive is majority of top national and regional contractors utilizing Virtual Design Construction (VDC) as their preferred project delivery method.

Owner and end users are part of the process too. The demand for information and BIM “deliverables” on new construction projects is being exhibited in the bidder qualification criteria and guidelines published by government agencies, universities, healthcare organizations, corporate campuses, and even K-12 school districts. Contract language (similar to the quotation noted on the right) clearly demonstrates an owner's desire for product data to be housed, updated, and exportable from BIM files for use in their facility management.

“It is the intention of the university to use BIM for facility management upon occupancy. Information that matures during the construction process is to be captured in the appropriate BIMs throughout the construction phase. Upon substantial completion BIM files shall be submitted to the university design and facilities department.”

So take a close look at those project bid documents. You may be surprised to find you're legally bound under a “BIM Execution Plan” or “Building Information Modeling Protocol Form” with subcontractor requirements to provide and update data to the BIM.

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BIM is not software.

The term “BIM” actually refers to files containing digital representations of the physical and functional characteristics of a facility. Structural, MEP, and architectural trades can all be represented in the BIM and the combined files can be very large. Within BIM are “objects” - basically repositories holding detailed information about a product and the 2D/3D geometry used for visualization. Door and frame openings are one example of a BIM object.

For distribution purposes, BIM can be best described as a collaborative process whereby intelligent 3D objects are used to communicate product and project data and decision making. Product information is meant to be shared across the “Building Lifecycle Process” from design and specification on to procurement, construction and installation, facility management, and finishing with disposal and aftermarket replacement. Architects, Contractors, Suppliers, and End Users all contribute and benefit from the flow of information.

On the other hand, software is the enabling tool used to facilitate the BIM process. There are numerous varieties of BIM software applications developed to meet the specific needs of an architect, contractor, or facility manager. Autodesk Revit® is one example of a 3D BIM authoring software tool. Other major BIM platforms used worldwide include Graphisoft ArchiCAD® and Bentley MicroStation®. Historically speaking, Revit® has taken roughly half the amount of time as AutoCAD® to become the leading BIM program used in practice by both architects and contractors in North America.

Interestingly, Contractors have embraced BIM software and tools faster than any other group in the industry, including architects. Some of the BIM applications used in construction process include Autodesk Navisworks®, Vico®, BIM 360 Field®, dRofus®, Solibri®, Synchro®, and Assemble Systems®.

Further downstream, facility managers are using programs such as FM Systems®, NETFacilities®, ARCHIBUS®, and EcoDomus FM® to improve asset tracking and support building operations and product life cycle maintenance and replacement.

Regardless of where and how BIM software programs are developed and used, they all have one critical requirement - Information.

Show me the Information!

When most of us hear the acronym BIM, we think of 3D modeling and visualization. While digital representations of door and hardware applications offer an enhancement over conventional 2D drawings, modeling is only one part of the complete picture. In reality, exchanging information through a model is the more important benefit BIM brings to the entire building life cycle process.

In a BIM environment, there are both “creators’ and “consumers” of information content. Creators add product data into the model for the consumers to extract and use in applications. The creators can be architects and specification writers working in the project planning, design, and contract documentation phases. Content refers to many types of product information including: quantities and sizes, construction materials, manufacturer names and descriptions, types and profiles, technical attributes, finishes, sustainability data, installation instructions, and the list goes on and on. URL link-outs to supplier contact information are even a possibility.

On the other end of the information flow are the content consumers. These are the contractors and end users who want to leverage the information as a means to improve construction efficiency, reduce waste, and better manage installed products after occupancy.

Distributors, and subcontractors, are right in the middle. As consumers, they need to extract data from BIM files to streamline estimating and bid proposals. They can also be creators when performing the role of specification writer for an architect or contractor, or by updating the BIM with their “as-supplied” project and product details.

Old Things. New Ways.

In a digital world it’s all about being fast, accurate, seamless, and mobile. The modern construction trailer is more likely to be outfitted with big screen monitors and laptops versus plan racks and drawing tables. Most project sites are now outfitted with hot-spots connecting to portable kiosks and hand held tablets. Virtual design, or the ability to “see before you build”, is used to identify and correct constructibility errors before they materialize at the jobsite. The accuracy of the data and details inside of models is allowing suppliers to prefabricate off-site and avoid in-the-field assembly and modifications.

Information from the BIM feeds the construction applications used for site planning and analysis, material take-offs, resource allocation, scheduling and phasing, spatial coordination, material tracking, and field communication. RFIs, deliveries, installation, and punch-out issues are tracked and updated via hand held devices and uploaded to the cloud. It’s an interconnected world built around information exchange and collaboration. BIM is delivering a positive ROI.

In a recent survey, major construction firms were asked to identify some of the challenges they commonly face when working with material subcontractors. Their top responses below are in many ways directly attributable to the accurate and timely flow of information.

- Change Management.
- Material Tracking.
- Installation.
- Quality Control.
- Communication (Access to Information).

Of course, these issues have been of concern to contractors long before BIM. However, the “new way” to seamlessly exchange data and information through objects and files is dramatically changing workflow processes. Change management, material costing and tracking, resource allocation, field verification and documentation are all moving away from the old ways of doing business.

Try as they might, distributors will not be able to hide or remain removed from this industry movement.

The screenshot displays a BIM software interface. On the right, a 3D wireframe model of a building is shown. On the left, a detailed door specification window is open, showing a door with dimensions 7' 3" high and 3' 4" wide. The window includes a list of components and their quantities:

Qty	Description	Material
3	Wedge (heavy wood)	WOOD
1	Wedge (heavy wood)	WOOD
1	Base Chime	WOOD
1	Wedge	WOOD
1	Set Door Sash	WOOD
1	Door Bottom	WOOD
1	Coat Hook	WOOD

Below the door model, a table lists door and frame specifications:

Mark	RPS	To Room	Contg	Width	Height	Thickness	Fire Rating	Arch Material	Material	Arch Type	Arch Material	Arch Type	HW Set	Comments
801			SC	3' 0"	7' 0"	1 3/4"		WOOD	Hollow Metal	D	FR	FR	3 Piece	8.0
802			SC	3' 0"	7' 0"	1 3/4"		WOOD	Wood	E	P201	FR	3 Piece	11.0
803			SC	3' 0"	7' 0"	1 3/4"		WOOD	Wood	E	P201	FR	3 Piece	11.0
804			SC	3' 0"	7' 0"	1 3/4"		WOOD	Wood	E	P201	FR	3 Piece	11.0
805			SC	3' 0"	7' 0"	1 3/4"		WOOD	Wood	E	P201	FR	3 Piece	11.0
806			SC	3' 0"	7' 0"	1 3/4"		WOOD	Wood	E	P201	FR	3 Piece	11.0
807			SC	3' 0"	7' 0"	1 3/4"		WOOD	Wood	E	P201	FR	3 Piece	11.0
808			SC	3' 0"	7' 0"	1 3/4"		WOOD	Hollow Metal	A	FR	FR	3 Piece	7.3
809			SC	3' 0"	7' 0"	1 3/4"		WOOD	Hollow Metal	D	FR	FR	3 Piece	6.3
810			SC	3' 0"	7' 0"	1 3/4"		WOOD	Wood	A	FR	FR	3 Piece	13.0
811			SC	3' 0"	7' 0"	1 3/4"		WOOD	Wood	A	FR	FR	3 Piece	13.0

At the bottom of the table, it shows: Total Qty: 210, Average Cost Per Opening: \$1,352.61, Total Cost: \$284,046.00.

Change is the only Constant.

Construction is a very inefficient and wasteful business. Up to 40% of project cost can be attributed to construction waste. Traditional 2D document based workflow used for years in the door and hardware industry contributes to the inefficiency. Specifications, estimates, schedules, and submittals that are reliant upon disconnected text documents, spreadsheets, and technical drawings are inherent with errors and inaccuracies. A different approach has been needed for some time.

Change has come in the form of integrated 3D, 4D (time), 5D (costing), 6D (product life-cycle management) systems and tools. Divisions 08 (Openings) and 28 (Access Control Systems) suppliers need to look no further than fellow structural and MEP trades to see where their BIM journey is leading. Eventually evolving building codes, owner protocols,

and government mandates will follow in support of BIM delivery methods. BIM is becoming the next version of a Green and sustainability movement.

Today, door and hardware objects are already available to download from a variety of internet sites and vendors. Sophisticated software applications are being used by architects and contractors to create, visualize, and modify 3D door and hardware openings and embedded manufacturer product data into the models. BIM generated files are being exported for use in estimating, scheduling, and project management and virtual "door libraries" are replacing paper based owner specification and construction guidelines.

The manner in which distributors are able harness and deliver information being created and consumed in a BIM environment will define their value-add for future business. Those unable or unwilling to move forward with acceptance may indeed find themselves left behind as the innovative leaders transform the industry for the next generation of distribution.

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ASSA ABLOY is the global leader in door opening solutions, dedicated to satisfying end-user needs for security, safety and convenience

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