Building information modeling, or BIM, has been in the construction industry’s vernacular for several years. Understanding what BIM really will mean to the future of our industry is paramount. If BIM is to be the go-to building concept, then masonry needs to be in the fold. Several organizations and associations are forging the way to make it happen. And, now, it’s time for the entire masonry industry to hop aboard the BIM train.

It’s important to first note that building information modeling (BIM) is not a product. It is a concept – a process – that involves digital models of a building. Several software companies make versions of BIM software. The software creates 3D models that represent every aspect of what a building is or could be, from exteriors to internal function.

Not only will a BIM model house information for all involved to access, but also the software can be queried to determine future possibilities, quantities, etc. for materials. More accuracy in the beginning will lead to fewer change orders later. Decision making becomes easier, and the decisions more valuable – less estimating, assuming and guessing occur. Time, money and labor can be saved as a result. From the first concept of a building through its maturity, information is shared. A definitive, trackable history exists.

What’s interesting about the concept of BIM is that it is considered a “disruptive technology,” in that it is going to significantly change the building process – perhaps in ways we don’t know yet. Rather than simply enhancing a current building method, BIM is its own method. The 3D model aspect creates useful capabilities, like clash detection, quantity take-offs, field BIM, direct fabrication and energy analysis. These are known as “value networks.” BIM models also store a wealth of facility information. Scheduling, estimating, site planning for material and equipment laydown, and more features for masons will be essential tools within BIM.

Incorporating masonry into BIM

Currently, if an architect or engineer wants to inquire about a type of material to see how it might look or function on a building, masonry is not there. Steel, concrete and precast are, and we can assume wood and light-gauge metal are fast on their heels.
The roadmap report will be owned by the six organizations aforementioned, but it will be for all interested masonry industry stakeholders as well.

Thanks to six determined and dedicated funding organizations, masonry is knocking at the BIM door as well. The Mason Contractors Association of America (MCAA), the National Concrete Manufacturer’s Association (NCMA), the International Union of Bricklayers and Allied Craftworkers (BAC), Western States Clay Products Association, the International Masonry Institute (IMI) and The Masonry Society (TMS) have banded together to urge software developers to include masonry in BIM software. To do this, the groups are working with The Georgia Institute of Technology (Georgia Tech), which is creating a “roadmap” to be completed in February 2013.

Georgia Tech’s team is led by Professor Chuck Eastman who is credited as the leader in BIM technology since the 1970s. Industry work groups of volunteer architects, engineers, material suppliers, vendors, masons, contractors, construction managers and executives have been diligently working as advisors to Georgia Tech.

“The roadmap report will be owned by the six organizations aforementioned, but it will be for all interested masonry industry stakeholders as well.

BIM is one-half computer science, and one-half building science. So, the roadmap will be both a technical and a marketing document. It will depict not only a vision for the industry, but also for the details of how we will get to that vision.

“The roadmap will be jargonistic and technical as well as a marketing document,” says Russell Gentry, a structural engineer and professor in the Georgia Institute of Technology School of Architecture, who is the project manager for Georgia Tech. “It can be used by the industry to see as a menu of usefulness. It will include project scopes and will be structured around what BIM means to architects and engineers, materials suppliers, mason contractors, general contractors and masons.

The report will use flowcharts, graphics and depictions over time,” Gentry continues. “It will be a wish list of sorts, and some of what is in the report will need clarification.

“The initial roadmap will give our vision of the future, and provide a basis for industry comment and input,” Gentry continues. “We imagine that the next phase of the project will clarify the roadmap and will initiate the first steps in the development of masonry BIM.”

www.masonrymagazine.com
Phase II

The second phase of the process of incorporating masonry into BIM software will begin in the spring of 2013, and will involve choosing some of the highest priority items, starting work immediately. For example, materials suppliers will need to develop digital production models of and create a digital library of masonry units and accessories in a common format. This will be considered by an existing “work group.” The contractor/masons work group will have a special task as well.

“We’ll need digital standards that describe masonry materials and systems,” says Gentry. “Masonry BIM models must interact within BIM, conveying things like weight, strength, color, availability and cost.

Gentry adds that the way that the walls are represented in the early stages or in architectural design will need to be considered. Architects play with form and volume, and when they are ready to place materials, digital tools need to be in place in BIM for masonry to be that material.

Planning documents will be created with requirements, digital product models, and schema (how something is represented in a computer) to determine how data structure and masonry fit in.

A “roadshow” will take place with a few different software companies. A prototype for a building will be provided to see what BIM can answer in regard to masonry, in the form of yes/no questions. Georgia Tech will write the software specifications, which takes about two years. Having software specifications established might help software companies feel less at risk regarding incorporating masonry.

So, one of two things could happen: Software companies might see adding masonry as important and, therefore, assume the development costs, implementing masonry over time. Or, the companies might choose to develop masonry into the BIM software with the help of some jumpstart money that our industry would need to raise.

Benefits for all

BIM will help to minimize change orders on jobs, increasing productivity for contractors and suppliers as everything will be well defined before the project begins,” says Jeff Buczkiewicz, president and CEO of the MCAA. “BIM also minimizes the element of surprise from the jobsite. Scheduling is a major issue on sites today, and that will be done before the project begins. The schedule will run more efficiently as a result.”

Biggs asserts that it all boils down to better communication. “Better communications will lead to fewer problems, less duplicated information and less erroneous information,” he says. “Better defined data and materials information will be readily available. Mason contractors will have fewer RFIs.

“If an architect creates a model and it’s full of features, he then can give it to a contractor, who can pick out details he’s
interested in,” Biggs continues. “Maybe he’ll click on a flashing installation, and a YouTube video pops up or is available. Training right at hand can be a powerful tool.”

It’s no secret that the masonry industry has to be more aggressive in marketing various masonry materials, and incorporating masonry into BIM will go a long way toward that effort.

“BIM will help with e-commerce,” says Gentry. “During the design phase, architects can query a particularly shaped brick, maybe a long brick stretcher, to see if it’s available. We can, for example, know before we start a project the availability from the suppliers, such as Boral or Interstate. Interstate already has inventory online for major distributors.”

We all win

HAVING MASONRY incorporated into BIM software will level the playing field with facts and information, says Buczkiewicz. “BIM will bring contractors and suppliers to the initial development process,” he says. “Software will be developed (and currently exists) to show the lifecycle costs of a project. BIM will allow an owner and designer to easily change components of a project and see the impact that change will have. In addition, it will add to the bottom line of everyone by making construction more efficient and safe.”

BIM software companies are aware that this study is in the works. Gentry says the development window would be two to three years. The hopes are that all players in the masonry industry will want to be a part of the effort. Bricks, blocks, stone – it doesn’t matter. All need to be represented as one: masonry.

Investment and Fundraising

An initial investment from the masonry industry will be, in part, to entice the software firms, according to Jeff Buczkiewicz, president and CEO of the MCAA. The industry needs to convince the software companies that masonry is needed in their programs and should be a BIM component.

“The software firms will need to invest a large amount of dollars in development of the initial software,” Buczkiewicz says. “The masonry industry supports this by offsetting some of their costs. Negotiations with the different software companies will happen after the roadmap is done, and will help determine the actual dollars that need to be raised for the project.”

An initial industry fundraising effort will take place, whereby individuals will be asked to give $1,500 over a three-year period ($500 per year). The contributions will be made to the MCAA Foundation, so all contributions would be considered tax deductible (501 C3). Companies will be asked for greater contributions.

Buczkiewicz adds that, once the software has been developed and implemented by the software firms, the programs will be maintained through the software firms that develop them, and no additional costs will be incurred by the industry.