

# Scaling the Building Information Mountain

*Chris Cook, managing Director of Model Solutions (AEC) Ltd. Looks at the key issues that arise when attempting to create a Single Building Model.*

The Building Information Model (BIM) is the current Holy Grail of the construction industry. Or so the marketing departments of the software companies would have us believe. The BIM is just one idea born out of the Re-Thinking Construction days of Sir John Egan. The idea is to improve the construction process by using integrated tools and collaborative processes thus saving money. It sounds straight forward enough. However there are a number of important issues that need to be addressed before we can claim to be successfully using BIMs.

## So what exactly is a BIM?

It is a 3D model-centric database coordinating the multi-disciplinary design, construction management, and operation and maintenance data associated throughout the lifecycle of a project. This is not a new concept and has also been known as an Integrated Building Model, Integrated Project Database, Virtual Building Model, and Single Model Environment etc. Whatever you choose to call it, it should reduce time and errors by integrating and coordinating all the project data, provide a platform for design and construction review, act as a building life

cycle management tool and ultimately reduce costs.

A number of large clients and construction projects are claiming to have successfully implemented a BIM or one of its stable mates. In reality this is not being fully realised, as there are still many technical, cultural and legal problems to be overcome.

Perhaps we should rename it the Building Information Mountain. It is a long journey from the 2D flood plains of the valley to the heady 3D (4D, 5D, nD) heights of total integration and collaboration. Is it really worth the effort? Well, definitely, but it's a perilous journey with many hazards awaiting the unwary or naive.

Most people haven't even started the journey. A few have fallen by the wayside. Some are lost in the 3D NURBS clouds on their journey to the top. No one has yet conquered the BIM summit although a few have flown over in a pig-shaped hot air balloon.

## So what are the key issues?

### Cultural

To enable the BIM to exist we have to believe in it. It has to be understood, we have to use it properly and we have to persevere with its development. It is imperative that all parties involved fully understand and support the BIM vision.

### Planning

It is crucial that the BIM is properly planned for and implemented at the earliest possible stage in a project. Modern communication tools provide us with a global market place but we are still unable to communicate effectively unless we are all speaking a common language using agreed syntax and

semantics. It is therefore essential that detailed standards and working practices be established at the earliest opportunity. Rigorously enforcing them is vital.

### Resources

To ensure an efficient BIM we require good resources of people, tools, processes, protocols, and lots of perseverance. The quantity and quality of these resources and how they are implemented and managed is fundamental to the success or failure of any BIM. Do not assume that because a huge budget is available for software and hardware procurement everything else will just fall into place.

### Size is everything

Project size and type is also an important factor. Current technical limitations do not allow a BIM to be easily applied to very large projects. The volume of data would simply overwhelm the system. However, a half way house is fully achievable and this provides many of the key benefits of a full BIM implementation. Small projects are unlikely to see a return on investment as the time and effort to implement a BIM is large and returns are typically yielded much later in the project lifecycle. The exception to this rule is with repeat order modular projects such as business park warehouse and office facilities.

### Implementation framework

How does the proposed BIM map to your existing IT, processes and culture? IT systems can be upgraded. Processes can be revised. But how are you going to address the cultural issues? Motivated and skilled people at all levels are essential to any successful project. However this is particularly important when

implementing a BIM. This requires highly skilled cross-trained staff with both construction and IT skills. One weak spoke in the wheel could see the whole thing buckling over.

### Legal issues

The type of legal framework underpinning the project is a key factor. Obviously an adversarial type contract just will not work from day one. BIMs are ideally suited to Design, Build and Operate type contracts. The BIM is largely a refinement of existing working practices so any contract that supports collaboration and the integration of cross-discipline data will benefit the most.

A key feature of current BIMs is that the overall ownership and management responsibility of the master model typically lies with one party. Who should this be? This problem is largely resolved on projects that currently employ project intranets/extranets. In this case a third party is responsible for hosting and managing the project data, access rights, backups etc. The introduction of model server technology may see a similar situation emerging with hosted BIM solutions.

### Software

Ultimately, every BIM is comprised of software and hardware. The choice of software is crucial as a wrong decision may have serious long-term financial implications. Basically, a BIM is a software system providing a platform for integration and collaboration. In other words, sharing data effectively. To do this, we ideally all need to be sharing the same file formats. There are two approaches to this age-old problem; neutral data exchange via the likes of IFC and XML or a proprietary format such as DWG or DGN.

Both approaches have many pros and cons but it is understandable that most people currently choose the proprietary approach. Hopefully this will change as we see the IFC's develop further and specialist tools, such as IFC model servers, become more widely available. Another key issue to consider is the system architecture of the BIM itself. Is it a centralised or distributed system? Distributed systems are inherently more scalable. Centralised systems should require less management.

### Conclusion

As we can see, the Building Information Mountain is littered with complex and sometimes treacherous paths. What we ideally need is a detailed topographical map of the mountain that will allow us to carefully plan our route. Unfortunately, all we receive from the BIM software vendors is little more than the equivalent of a pirates treasure map.

Lets not lose sight of what we are trying to achieve here, as the financial rewards for a successful implementation are great. Indeed, major clients are already recognising the benefits and are beginning to insist on it. The software has now matured into a position where a BIM is technically possible. You will have to customise the software and possibly implement a few workarounds but *it is* possible. Suitable hardware and communications technology is also available. So that just leaves the cultural and legal issues to resolve. If you happen to have a suitable project in the pipeline with a skilled and motivated team then there is simply nothing stopping you.

### Model Solutions

Model Solutions (AEC) Ltd. are a specialist Built Environment consultancy committed to innovate in the development and implementation of 3D Object Modelling Systems, Design Integration and Collaboration Technology. Model Solutions are currently engaged on BAA's landmark project, Heathrow Airport Terminal 5.

Chris Cook, the managing director, has 25 years of experience in the AEC industry. He has been a developer and expert user of 3D object modelling systems since 1995 and is currently undertaking an MSC in IT Management in Construction.

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