

Building Information Modelling January 2010

Building Information Modelling (BIM), we are told, has arrived in the construction industry and been widely adopted for complex projects. It is not tomorrow's vision but today's reality, and in a few years it will be standard.

These claims are made for BIM in a paper that was presented at an international conference in London in October 2008, concerning the use of BIM in the US.¹ A building information model is, in essence, an information resource in relation to a particular facility to be designed and constructed, but it is also a digital simulation of the facility that provides the ability to "rehearse" construction and updates itself automatically as more information is added. Thus the model will adjust automatically to design changes.²

In its purest form, a BIM project would use a single data model for all purposes. Each participant would access the model, adding content that could be accessed immediately by all others. Exploration, analysis and evaluation would take place within the model with information being exported as contract documents, fabrication drawings, bills of materials, estimates, costs or other information.³ The model also contains information for managing the facility as well as constructing it.

That, anyway, is the ideal. However, the author of the paper referred to emphasises that the development of BIM to its full potential has some way to go. At present, there will rarely be a single model on a complex project. More commonly, each participant will have its own model, which interrelates with the others. Further, the model (or, more accurately, the series of interrelated models), does not usually contain all the construction details required for a project. Thus the contract documents will include some 2D information to supplement the information in the model.⁴

Indeed BIM can simply be used by a designer as an aid to the traditional design process. This has been described as simply CAD on steroids,⁵ and plainly the advocates of BIM envisage that it will generally be used more ambitiously than this.

The technological challenges seem formidable. In theory, different models will communicate seamlessly. This, though, is described as an aspiration, not a reality, under current technology. Differences in capability between BIM software mean that there are real risks of data being changed or lost.⁶

However, there are also perceived problems or obstacles to use of BIM – at least, in the US – of a business or legal nature, due largely to liability concerns. In particular, it is said that designers are the main problem. BIM can, it is thought, increase a designer's potential liability, and because they do not share (at least, to the same extent as others) in the economic benefits of BIM, they have little incentive to adopt the BIM process. Yet it is designers who must adopt and invest in the new technology. Design professionals are the linchpins of BIM.⁷

¹ Building Information Modeling: A Framework For Collaboration by Howard W. Ashcraft. An updated version of the paper, dated June 2009, is on the website of the Society of Construction Law, to which the page references in these footnotes refer.

² Ashcraft, pages 3, 4

³ Ashcraft, page 25

⁴ Ashcraft, pages 13, 15

⁵ Ashcraft, page 13

⁶ Ashcraft, pages 13, 14

⁷ Ashcraft, page 10

There does indeed seem to be some caution among professional consultants in the US about the use of electronic material. The AIA owner-architect agreement states that material provided in electronic form must be the subject of a separate written agreement (though licences that have since been produced pursuant to this requirement are said to embody a more open approach).⁸ Documents published by the Engineers Joint Contract Documents Committee disallow any reliance on electronic information, and place the risk of errors and discrepancies on the receiving party: files in electronic media are stated to be furnished only for the convenience of the receiving party.⁹ There are clearly concerns about design responsibility when BIM designs change in response to input from others or due to embedded software. In virtually all jurisdictions in the US, design professionals of record must be in “responsible charge” of the design. There are concerns too about ownership of material that is fed into a model along with material from others, about confidentiality, preservation of electronic data and the legal status of the model.¹⁰ Such problems are exacerbated by, but are also of course partly the cause of, the lack of standard contract documents to address these matters.

Underlying many of these concerns is a general concern – or perceived concern – about collaboration generally. BIM, if used to full advantage, leads naturally to intensive communication and interdependence. However, it is said that collaboration is not a construction industry hallmark. Collaboration and interdependence blur the distinctions between the parties, but the legal systems are essentially individualistic, focusing on individual rights and responsibilities.¹¹ An essential component of collaboration is the readiness and ability of a design professional to rely upon information provided by other participants and, to some extent, by the software itself. Reluctance to do this is likely to inhibit the sort of collaboration needed to make BIM truly effective.

This situation is leading to calls for fresh thinking on the forms of business relationships that characterise the construction industry and for arrangements that acknowledge the blurring and blending of roles and responsibilities. The most radical suggestion is a form of alliancing, which involves no liability between the parties, who agree that they will not sue each other, and a collective sharing of project risks, and a portion of compensation being tied to a successful outcome (painshare/gainshare). BIM is said to be tailor made for alliancing.¹²

Should BIM and collaboration in general cause the same business and legal concerns in the UK? There are reasons to think not.

Designers owe a professional duty to exercise reasonable skill and care and should only be liable if they are in breach of that duty. If a design is defective, that may indicate that the designer has failed to exercise reasonable skill and care, but it does not determine the point. In the US, the position of designers may be more vulnerable, due to what is known as the Spearin doctrine, under which plans and specifications provided for a construction project are warranted by the owner to be free from defect. This doctrine, established in a case in 1918, is intended to protect the contractor, who can not, as a result, be liable if it constructs a building to a defective design. Although the warranty is not given by the designer, it makes it all the more likely that the owner will seek redress from the designer if there is a problem with the design.

One can understand, therefore, why designers in the US may be wary of participating in a collaborative process to produce designs which will be subject to a warranty. One can also understand why contractors would also be wary of participating, as their participation could negate the warranty.

⁸ Ashcraft, pages 11 to 12

⁹ Ashcraft, page 11, note 24

¹⁰ Ashcraft, pages 16, 17, 21 to 23.

¹¹ Ashcraft, pages 2, 18

¹² Ashcraft, pages 32, 33

There is no Spearin doctrine in English law. Contractors are generally considered to be protected if they execute the design in accordance with the terms of the contract. There is some law to suggest that a contractor may have a duty to warn of a dangerous design, but it is not an area of the law that has developed very far. Nor, for designers, is there the same issue of formal design responsibility that there is in much of the US.

Another matter that may well cause concern in the US about the sort of collaboration envisaged in connection with BIM is the law of tort, in particular the Restatement of Torts Second section 552, which sets out the requirements for a negligent misrepresentation claim. In brief, these make a person liable for pecuniary loss caused to others in the course of a business as a result of their relying upon false information supplied by that person, if he fails to exercise reasonable care or competence in obtaining or communicating the information. It is not hard to see how this rule of law could make designers liable to others involved in a collaborative project as a result of their input into the project; the greater the degree of collaboration, the greater the risk of this happening.

No such principle of law applies in English law. The incremental approach of the common law to the development of duties of care has deliberately eschewed the adoption of an all-embracing principle. A person who gives wrong information to another person knowing that the other person is likely to rely on it may be held, in the circumstances, to have owed a duty to the other person, but it all depends on those circumstances. Any such duty in respect of economic loss has seldom been held to arise as between participants in a building project who are not in contract with each other, either during the planning and design stages or during the works themselves. The policy of the law in this area is for economic loss to be recovered, if it can be recovered, through the contractual route. As collaboration intensifies as a result of BIM, it is possible that the law may move in the direction of imposing duties of care in tort among the participants, but there is no reason at this stage to think that this is likely to happen.

The standard of professional care that will apply in any given situation is inherently flexible and develops and changes with the way that the practice of the profession itself develops and changes. The growth of collaboration in connection with BIM will no doubt give rise to questions as to what a designer should or should not do in hitherto unfamiliar situations, and appropriate standards of conduct will evolve, aided by guidance from professional bodies. Whether, for example, it is or is not appropriate for a designer to rely on a particular piece of information in a given situation will fall to be judged in the light of the relevant standards of the designer's profession at the relevant time. This is surely to be preferred, at least in principle, to endeavouring to draft contract terms specifying levels of permitted reliance or other standards of conduct or attempting to define a general obligation to collaborate. Contract drafters should generally resist telling professional people how to do their work; that principle should apply just as much where the work involves participating in the development of a building information model.

Concern has been expressed about the ownership of the model and of documents derived from it, when there have been so many different inputs. However, there is no reason why multiple ownership should cause particular problems. A person who contributes to a model will normally be thereby agreeing implicitly, if he has not already done so expressly, to his input being used on the project for which it is given. Consent can still be subject to payment of fees. There is no reason why the contractor or the project owner should be in a worse position. There would be no justification for ownership of the model being transferred to the project owner, who will have a licence to use the model in relation to the facility which is constructed from it.

Where there is to be a central model, the issue of management of the model would have to be addressed, and the sensible solution would seem to be to appoint a model manager with the appropriate expertise with responsibility for co-ordinating development of the model, including all matters involving transfer of data to and from it. Responsibility, however, is not the same

thing as liability; the model manager, like any other professional, should be liable for failure to exercise the appropriate degree of skill and care but should not be made strictly liable for data corruption or loss. Reference is sometimes made to a liability gap arising from the contractual limitations that are usually found in software suppliers' standard terms and conditions. However, there is nothing inherently controversial about a loss for which no one is liable, and risk allocation, to cover situations for which there is no legal liability, is not the appropriate basis for a professional appointment. Professional consultants do not take risks in this sense and professional indemnity insurance does not insure against such risks.

At the end of the day, the project owner stands to gain most from BIM, is the only party in a position to insist on its use and must be the party who bears the risk of any technological problems arising from BIM for which no one can be held legally liable. As the technology improves, this risk should grow less and project owners should be more inclined to require the use of BIM.

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