

Preparing for Building Information Modelling

Discussion Paper by Peter Cocciardi.

In its most basic form, **Building Information Modelling (BIM)** is the move from analogue to digital design and construction. It is a model-based technology linked with a database of project information. And it is poised to fundamentally change the way projects are built and the way project stakeholders communicate with each other.

In recent years, the construction industry has seen an increased use of project collaboration systems that foster interaction between team members. Over the last decade, firms have migrated to electronic drafting, view coordination, document generation, and schedule creation. These changes, however, are minor compared to the coming age of BIM.

Integrating the Design Process

Radically transforming the way designs are created, communicated, and constructed, BIM is not just the electronic transfer of paper documents. It greatly increases the ability to control and manipulate data and information in an unprecedented way and in an interoperable format. The move from paper-centric information to parametric, model-based information means that the digital design can be used for cost estimations, simulations, scheduling, energy analysis, structural design, GIS integration, fabrication, erection, and facilities management.

Building models embedded with detailed information about a construction project are far beyond the capabilities of most design firms at present. These models are not just the electronic drafting tools that firms now think of as digital practice, nor are they three-dimensional renderings with separate construction documents. The move to an integrated, parametric, and object-based system should lead to dramatic changes in design and construction as well as, possibly, compensation and risk allocation.

Increasing Value through Shared Information

The result of the design process is not just a creation of the design. A building information model is a repository for digital, three-dimensional information and data generated by the design process and simulations—it's the design, fabrication information, erection instructions, and project management logistics in one database. The data model will exist for the life of a building and can be used to manage the client's asset.

Because the true benefit of BIM is to the project owner, the push to use BIM will most likely be a client-driven development. The value is in the significant building efficiencies and initial cost savings and extends to the operations and maintenance of the facility.

Based on expert studies, other benefits of BIM include reduced risks, improved productivity, streamlined production, maintenance of design intent, and facilitation of quality control through clear communication and sophisticated analytical tools.

Addressing Legal Exposures

The idea of parametric modeling as the design and construction database is a difficult one to examine from practice and insurance-coverage perspectives. Firms will have increasing challenges as they realize that they are moving from a physical model—and hard-copy plans and specifications—to the primary information generators for a digital database.

As firms move from an analogue system (where original source material is relatively easy to identify and control), through our present “semi-integrated” system, to what could be called the “super-integrated” future, those firms will have to deal with new business rules and possibly unknown liability exposures.

Taking Charge of the Process

Professional service firms should be in control of the information source. As integration of design and construction develops, protecting public health, safety, and welfare becomes more critical. The rationale for having a licensed professional in charge makes increasing sense. The professions, however, must become capable of monitoring and guiding the inevitable “looping” of design and construction features to conform with the intent, design constraints, and requirements of the design.

Bringing the Future—Slowly

The construction industry as a whole (or the law) will have to deal with some significant issues:

- Definition of professional services and the design process
- Ownership and control of the digital information
- Regulation or control of revisions to modeling information
- Conformity of completed construction to the model
- Relationships of the various parties with concurrent design and construction authority
- Risk that goes with any investment by the stakeholders
- Payment for the creative efforts, control of information, and assumed or assigned risks.

Professional liability exposures seem to be only one small part of the whole definition of design and construction completed using BIM. This will be a rapidly evolving issue as BIM leads to an even more complex phase of design, construction, and operation.

Peter Cocciardi.

Managing Director - Cocciardi Pty Ltd

President – Australian Institute Steel Detailers Vic / Tas.

Chairman National Committee – Australian Institute Steel Detailers.