

# Chapter 22

## BIM Adoption: Expectations across Disciplines

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### ABSTRACT

*This chapter presents a comprehensive analysis of the current state of Building Information Modelling (BIM) in the Architecture, Engineering, Construction and Facility Management (AEC/FM) industry and a re-assessment of its role and potential contribution in the near future, given the apparent slow rate of adoption by the industry. The chapter analyses the readiness of the industry with respect to the (1) tools, (2) processes and (3) people to position BIM adoption in terms of current status and expectations across disciplines. The findings are drawn from an ongoing research project funded by the Australian Cooperative Research Centre for Construction Innovation (CRC-CI) that aims at developing a technological, operational and strategic analysis of adopting BIM in the AEC/FM industry as a collaboration platform.*

### 1 INTRODUCTION

BIM (Building Information Modelling) is an IT (Information Technology) enabled approach that involves applying and maintaining an integral digital

representation of all building information for different phases of the project lifecycle in the form of a data repository. The building information involved in the BIM approach can include geometric as well as non-geometric data. Geometric data refers to information such as 2D drawings, 3D models, and

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their dimensional and spatial relationships. Non-geometric data can refer to textual data such as annotations, reports and tables; visual data such as sketches, graphs and images; multimedia data such as audios and videos, as well as other forms of information generated during the building project lifecycle. BIM is expected to envision efficient collaboration, improved data integrity (Ellis, 2006), intelligent documentation (Popov et al, 2006), distributed access and retrieval of building data (Ibrahim et al, 2004b) and high-quality project outcome through enhanced performance analysis, as well as multi-disciplinary planning and coordination (Fischer and Kunz, 2004; Haymaker et al, 2005; Haymaker and Suter, 2006).

While the potential benefits of the BIM approach in terms of information sharing and management, as well as project collaboration, and coordination may seem evident, the adoption rate of BIM has been rather lethargic. A number of factors, such as a lack of awareness and training, the fragmented nature of the AEC/FM industry, industry's reluctance to change existing work practice and hesitation to learn new concepts and technologies, and lack of clarity on roles, responsibilities and distribution of benefits, have been identified in the literature as major barriers to BIM adoption. Most of the earlier research on BIM adoption has focussed on specific disciplines of the AEC/FM industry where surveys and questionnaires have generally been used to collect the research data. The findings reported in this chapter forms an important part of an action-oriented research that aims at the development of a technological, operational and strategic analysis of adopting BIM in the AEC/FM industry. This chapter builds on the earlier research on BIM adoption but uses Focus Group Interviews (FGIs) as the main method of data collection. FGIs differ from surveys and questionnaires, not only because they enable the collection of more in-depth research data on BIM adoption, but they also provide a forum for the different disciplines of the AEC/FM industry to share and clarify their views on

various BIM adoption issues, such as a common understanding of benefits, hurdles, requirements and expectations of BIM.

FGIs were conducted with experts from major AEC/FM practices and associates including architects, engineers, contractors, consultants, project managers, facility managers, delegates from government agencies, academics and software application vendors. A comprehensive background study of BIM literature and current commercial BIM applications had been conducted beforehand to identify key issues, put forward topics for discussions during the FGIs, and serve as a benchmark for the analysis and comparison of the collected FGI data. A coding scheme has been designed specifically to analyse the FGI data. The design of the coding scheme has been based on the dominant themes identified through the initial open analysis of the FGI data and the background study. The coding scheme is developed (1) to identify the priority issues across different AEC/FM disciplines regarding BIM adoption; and (2) to determine the current level of awareness, knowledge and interest in BIM across the disciplines. Through the FGI data analysis, this chapter identifies the key issues that need to be addressed for BIM adoption. The chapter concludes by highlighting the current and future extension of the research and by analysing the readiness of the industry with respect to the (1) tools, (2) processes and (3) people to position BIM adoption in terms of current status and expectations across disciplines.

## **2 BACKGROUND**

The background study involves a critical review of available BIM literature together with a comprehensive desktop audit of current commercial BIM applications.

The BIM literature review provides a context for the research. The review also offers a comprehensive understanding of common practice in the AEC/FM industry, and informs on the

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