

Chapter 13

Towards the Development of a Project Decision Support Framework for Adoption of an Integrated Building Information Model using a Model Server

Kerry London

Deakin University, Australia

Vishal Singh

University of Newcastle, Australia

Ning Gu

University of Newcastle, Australia

Claudelle Taylor

Nexus Point Solutions, Australia

Ljiljana Brankovic

University of Newcastle, Australia

ABSTRACT

This chapter discusses an action research study towards the development of a decision framework to support a fully integrated multi disciplinary Building Information Model (BIM) using a Model Server. The framework was proposed to facilitate multi disciplinary collaborative BIM adoption through, informed selection of a project specific BIM approach and tools contingent upon project collaborators' readiness, tool capabilities and workflow dependencies. The aim of the research was to explore the technical concerns in relation to Model Servers to support multi disciplinary model integration and collaboration; however it became clear that there were both technical and non technical issues that needed consideration. The evidence also suggests that there are varying levels of adoption which impacts upon further diffusion of the technologies. Therefore the need for a decision framework was identified based on the findings from

DOI: 10.4018/978-1-60566-928-1.ch013

an exploratory study conducted to investigate industry expectations. The study revealed that even the market leaders who are early technology adopters in the Australian industry in many cases have varying degrees of practical experiential knowledge of BIM and hence at times low levels of confidence of the future diffusion of BIM technology throughout the industry. The study did not focus on the benefits of BIM implementation as this was not the intention, as the industry partners involved are market leaders and early adopters of the technology and did not need convincing of the benefits. Coupled with this there are various other past studies that have contributed to the 'benefits' debate. There were numerous factors affecting BIM adoption which were grouped in to two main areas; technical tool functional requirements and needs, and non technical strategic issues. The need for guidance on where to start, what tools were available and how to work through the legal, procurement and cultural challenges was evidenced in the exploratory study. Therefore a BIM decision framework was initiated, based upon these industry concerns. Eight case studies informed the development of the framework and a summary of the key findings is presented. Primary and secondary case studies from firms that have adopted a structured approach to technology adoption are presented. The Framework consists of four interrelated key elements including a strategic purpose and scoping matrix, work process mapping, technical requirements for BIM tools and Model Servers, and framework implementation guide. The BIM framework was presented in draft format again to key industry stakeholders and considered in comparison with current best practice BIM adoption to further validate the framework. There was no request to change any part of the Framework. However, it is an ongoing process and it will be presented again to industry through the various project partners. The Framework may be refined within the boundaries of the action research process as an ongoing activity as more experiential knowledge can be incorporated.

1 INTRODUCTION

Despite the apparent benefits in terms of information sharing and management, efficiency in information flow and associated overall anticipated cost benefits, as well as project collaboration and coordination may seem evident, the adoption of BIM in practice has been slow (Bernstein and Pittman 2004). Many factors have been identified which contribute to the slow rate of adoption including; lack of training (Khemlani 2007), low business incentives (Holzer 2007), perception of lack of rewards (London and Bavinton, 2006), technological concerns (Howard and Bjork 2008), industry fragmentation related to uneven ICT adoption practices (London and Bavinton, 2006), contractual matters and resistance to changing current work practice (Johnson and Laepple 2003). In fact, the majority of the past studies were conducted at a distance from the research participants.

The aim of this national research study was to review and analyse the current capability of Model Servers leading to open software technical requirements with special emphasis on the so-called “non-functional” specification for BIM Model Server which would cater for digital models accessible through a web interface. The approach was to conduct the research collaboratively with industry market leaders who had been early adopters of the BIM approach. The findings reported in this chapter form an important part of an action-oriented research study which seeks to explore the technological, operational and strategic factors related to adopting BIM in the AEC/FM industry. There were five major phases to the study including:

Phase 1 Literature Review: An overview of BIM model server based collaboration platform including a literature review and discussion on the BIM approach and levels of technical capabilities and technology adoption.

29 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/towards-development-project-decision-support/39477

Related Content

Geometric Modelling and Computer-Aided Design

Xun Xu (2009). *Integrating Advanced Computer-Aided Design, Manufacturing, and Numerical Control: Principles and Implementations* (pp. 1-31).

www.irma-international.org/chapter/geometric-modelling-computer-aided-design/8475

Technologies for Sustainability Within the Framework of the Fourth Industrial Revolution

Ingrid Yadibel Cuevas Zuñiga, María del Rocío Soto Flores and Ericka Molina Ramirez (2021). *Research Anthology on Cross-Industry Challenges of Industry 4.0* (pp. 503-512).

www.irma-international.org/chapter/technologies-for-sustainability-within-the-framework-of-the-fourth-industrial-revolution/276836

Addressing Privacy in Traditional and Cloud-Based Systems

Christos Kalloniatis, Evangelia Kavakli and Stefanos Gritzalis (2014). *International Journal of Applied Industrial Engineering* (pp. 14-40).

www.irma-international.org/article/addressing-privacy-in-traditional-and-cloud-based-systems/105484

Multiple Criteria DEA-Based Ranking Approach With the Transformation of Decision-Making Units

Jae-Dong Hong (2021). *International Journal of Applied Industrial Engineering* (pp. 1-20).

www.irma-international.org/article/multiple-criteria-dea-based-ranking-approach-with-the-transformation-of-decision-making-units/276088

Retailer Ordering Policy for Deteriorating Items with Initial Inspection and Allowable Shortage Under the Condition of Permissible Delay in Payments

Chandra K. Jaggi and Mandeep Mittal (2012). *International Journal of Applied Industrial Engineering* (pp. 64-79).

www.irma-international.org/article/retailer-ordering-policy-deteriorating-items/62989