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Project cost management with 5D BIM

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Abstract

This paper explores the practical issues and constraints faced by project cost management professionals in the implementation and effective utilization of the various software, technologies and tools that are now available in the rapidly developing Building Information Modeling (BIM) sphere. BIM and its allied digital technologies and tools provide enormous opportunities for project cost management professionals to dramatically improve the quality, speed, accuracy, value and sophistication of their cost management services and therein ensure their future as key players in the BIM world. However, the profession has generally been slow to embrace and evolve with the full potential that these technologies can provide. There is now considerable momentum building as firms realize they have to embrace these technologies and see competitors seizing market advantage through developing expertise in the field. The purpose of this paper is to explore the issues faced by firms and to identify successful practices, procedures and strategies that firms are implementing. The research methodology for the paper is based on detailed interviews with Quantity Surveying firms in Australia. The results show that the interviewed firms are spending a lot of time and effort in developing their expertise and that there was a consistent pattern in relation to the main issues and problems and what was needed to be successful. The greatest issues related to the quality/comprehensiveness of the BIM models, difficulties with designers not providing full access to the models and software/standards compatibility issues. Successful strategies were clearly based on strong commitment and leadership from company directors and positive approaches to dealing with the issues and challenges faced. The paper concludes with a range of recommendations and strategies to help address these issues.

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Keywords: 5D BIM, Project Cost Management

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1. Introduction

Building Information Modelling (BIM) provides both opportunities and challenges for the project cost management profession. As quantification increasingly becomes automated and BIM models develop the role of the project cost manager will need to adapt accordingly to provide more sophisticated cost management services that incorporate 4D time and 5D cost modelling and sharing cost information/data with the project team as part of the BIM integrated project delivery approach. The RICS (2014) contend that BIM provides project cost managers with the opportunity to spend more time on providing knowledge and expertise intensive advice to the project team - the automation of processes such as quantification will substantially reduce time spent on technical processes and will provide more time and the digital tools for higher value-added and more sophisticated cost management services. Mitchell (2012) describes the importance for the project cost management professional to embrace the 5th dimension and become key players in the BIM environment – the '5D Project Cost Manager'. Muzvimwe (2011) supports this notion and describes the value of the cost manager in being able to simulate and explore various design and construction scenarios for the client in real time through having their cost data and quantities integrally linked in the live BIM model. This certainly raises the value of the cost management service but is dependent on the cost manager having BIM capability/expertise, sharing their cost data in the model and having the experience, expertise and intuition to analyse and critique the information that is being generated by the model.

2. 5D BIM Implementation

The development of 5D (Cost) capabilities is gaining momentum and leading edge project cost management firms are starting to realize the competitive advantages by embracing this 'new-age' approach to cost management. A major catalyst for the profession using this technology occurred in 2008 in the United States. The Association for the Advancement of Cost Engineering International (AACE), the American Society of Professional Estimators (ASPE), the United States Army Corps of Engineers, the General Services Administration (GSA) and the National Institute of Building Sciences (NIBS) formed an agreement to work together to solve cost engineering related problems for the facilities industry under the building SMART Alliance. The purpose was to develop systems and protocols for collaboration and coordination of cost engineering and estimating through the project lifecycle. 'The consortium continues to adjust to, and coordinate with ever-changing standards, so that the process of extracting and processing the 5D (cost) information from the BIM model is clearly defined, especially as the design evolves' (ConstruchTech 2013, p.1).

In 2012 the Royal Institution of Chartered Surveyors (RICS) published new guidelines known as the Black Book (Quantity Surveyor and Construction Standards) and New Rules of Measurement (NRM). The Black Book is a comprehensive suite of documents that defines good technical standards for Quantity Surveying and Construction. The New Rules of Measurement suite provides a common measurement standard for cost comparison through the life cycle of cost management. *"The suite has been developed as a result of industry collaboration to ensure that at any point in a building's life there will be a set of consistent rules for measuring and capturing cost data, thereby completing the cost management life cycle and supporting the procurement of construction projects from cradle to grave. A better understanding of costs during the construction process will increase certainty for business planning and support a reduction in spending on public and private sector construction projects in the long run"* (Property Wire 2012, p.1).

The New Rules of Measurement are integrally linked with BIM and enables a consistent approach to estimating and cost planning within BIM platforms. The RICS are currently looking at developing international standards in collaboration with other kindred associations and industry. The RICS have also recognized the need for global guidance for companies in terms of BIM implementation. They recently published a comprehensive 'International BIM Implementation Guide' for construction professionals and contractors that includes specific guidance for project cost managers (RICS, 2014). They note that *"as the industry takes hold of this new future it is essential that organisations and individuals are not flying blind but have information to plot out a change plan and BIM implementation trajectory both for now and indeed a 'future wise' longer term digital strategy"* (RICS 04, p.1).

The extent of firms effectively implementing 5D technology is difficult to gauge. An innovative project cost management firm in Australia provides a good example of what is starting to happen. Mitchell Brandtman are a