Accelerating the Implementation of BIM by Integrating the Developments Made in Knowledge Management: An Irish Construction Industry Perspective

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ABSTRACT

In Ireland the construction sector is at the initial stages of assessing and adapting Building Information Management (BIM) on pilot projects. At an initial summary review BIM could be seen as a fad that will burn out as quickly as it appeared. Many of the concepts associated with BIM are grounded in Co-ordinated Project Information (CPI), Integrated Project Delivery (IPD) and object modelling which have been developed over the last 20-30 years. This research presents the critical success factors (CSF) associated with knowledge management (KM) and investigates the correlation of these with the development and integration of BIM within the construction industry in Ireland. These CSF will be addressed in the context of assessing maturity levels prior to integrating KM or BIM. Determining the CSF will accelerate the implementation of BIM. Developing a BIM CSF Analysis Model will assist in assessing a company’s readiness to embark on BIM projects.

Keywords: Building Information Model Analysis Model (BIM Analysis Model), Co-Ordinated Project Information (CPI), Critical Success Factors (CSF), Ireland, Knowledge Management, Maturity Models

INTRODUCTION

Building Information Modelling (BIM) is one of the most visible aspects of change that is impacting the global Architectural, Engineering and Construction (AEC) industry. The growing adoption and implementation of BIM worldwide for its data-based modelling, visualisation, analysis and simulation capabilities represents the start of an integrated digital information infrastructure that will ultimately impact on almost all aspects of the construction industry.

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BIM is not something new; it has been developing over the last 20-30 years but has rapidly developed in the last five years. In the United Kingdom (UK) this development has been due to the government’s mandate through their BIM strategy. In Ireland much of the indigenous construction industry has slowed and some Irish consultants are now collaborating on international projects. BIM is becoming one of the key tools to facilitate that collaboration in an online environment. The trends to the increase of working in BIM are evident in the latest McGraw Hill Construction market survey on BIM which shows 49% adoption rate in the U.S. and 36% between UK, Germany and France (Bernstein, Jones, & Gudgel, 2010). Finding more cost effective and highly efficient ways of producing good quality, reliable and coordinated, design and construction documentation is key to competitive advantage and survival in the current economic climate. According to Ralph Montague Construction Information Technology Alliance’s (CITA) BIM Group Leader, the Irish construction industry is falling behind the developments in technology and procurement processes over the last 5 – 10 years and consequently Ireland is at a competitive disadvantage in the global market. Innovation, in the eyes of economists, has long been regarded as the engine of economic growth during recession. According to Philp (2012), Head of BIM Implementation Cabinet Office, the current economic crisis is a perfect opportunity for companies to improve project performance, gain competitive edge and offer new value added services to clients.

GROWTH OF BIM INTERNATIONALLY AND IN IRELAND

The research conducted by Bernstein et al. (2010) in assessing the proliferation of BIM application to construction projects in North America and Western Europe (UK, Germany, and France) highlighted the disparity of development of BIM in these two regions with 49% in North America compared to 36% in Western Europe. Within these headline figures a number of interesting underlying results were apparent. 34% of Western Europe BIM users have in excess of 5 years’ experience of working with BIM in comparison to 18% of North American users. The strongest uptake for BIM in North America is currently among contractors at 50% whereas in Western Europe this figure is at 24% with France at 26% uptake among contractors. The research further analysed the results between UK, Germany, and France. Here it is evident that the usage is consistent across all three with between 35-38%. The aspects of BIM considered most valuable are consistent:

1. Reduced conflicts during construction;
2. Improved collective understanding of design intent;
3. Reduced changes during construction;
4. Improved overall project quality.

The future expected adaption of BIM on projects is shown as a growth area both in North America and Western Europe.

For example, in the UK in 2012 the National Building Standards (Waterhouse, 2012) presented their findings on their survey of the construction industry’s attitudes towards BIM. Their findings are consistent with research (Bernstein et al., 2010) showing continued growth in awareness of BIM and in the application of BIM on projects. There was also consistency in the aspects seen as most valuable from BIM:

1. Improves visualisation;
2. Increases of coordination of construction documentation.

Redmond et al. (2012) identified the main features of BIM as its ability to share synchronised information from multiple users on a single project.

In relation to the Irish sector, the position BIM holds is somewhat difficult to assess. There has been very limited empirical research presented; however what can be identified is
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