Project Management & Computer-Aided System - BIM

Exploring the Impact of BIM on Sustainable Construction Processes, and its Opportunities in the Construction Sector of China from Project Management Point of View.
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1. Background & Introduction

Over the last decade or so, a considerable amount of research has been performed to improve the processes and efficacy of project management in the construction industry. Problems such as poor management system, cost overruns and time delays have resulted in frustrations and uncertainties among investors and industry professionals as the lean principles of project management heavily relied on the productivity of the human resource and the management. Moreover, the expectations pertaining to sustainability compliance/duties as well as higher profit levels resulted in the need to develop advanced engineered solutions. Thus, to ensure optimum project management, maximum productivity, compliance to societal responsibilities and sustainability in the construction sector, a range of tools and techniques have been introduced by the researchers and industry professionals in order to tackle the former problems. However, no other invention in the construction industry over the last several years has been as fascinating as the Building Information Modelling, also commonly known as BIM (Li et al., 2009; Aryaici, et al., 2011).

In developed countries such as the USA and UK, the importance of using BIM in the construction industry has been vastly recognized. According to HM Government 2012, Relevant government departments and ministries are encouraging investors, project managers, stakeholders and contractors to put on emphasis to lead these technological innovations.

“BIM will integrate the construction process and, therefore, the construction industry. But it will also have many additional benefits for the nation. It will enable intelligent decisions about construction methodology, safer working arrangements, greater energy efficiency leading to carbon reductions and a critical focus on the whole life performance of facilities (or assets). Of even greater importance are the benefits for the economy that will accrue from better buildings and infrastructure delivered by the construction industry.”
Graham Watts, OBE, Chief Executive Officer, Construction Industry Council, HM Government UK.

Thus, it is important to note the value that BIM adds to the management of construction projects by increasing the reliability and authenticity of available information/data. This in return helps project managers to make well-informed decisions on building environment which are based on real-time scenarios. The role and use of BIM models successfully employed by UK and USA constructions companies are therefore of high interest to Chinese construction market because they will help to establish a relationship between the application of BIM technologies and sustainable construction in the region.

The industry of architecture, engineering and construction (AEC) is buzzing with the sound and excitement of green construction and enhanced Project Management through BIM. It will not be wrong to say that BIM is the most influential and noteworthy development of the construction industry in the last 10 years, primarily because of the opportunity it provides to improve the efficiency of construction process management. When it comes to efficiently managing building design and the project data, there is no technology better than BIM mainly due to its ability to record even the most complex activities and processes. BIM allows for smooth processing of all construction-related information and provides accurate project drawings (CSQ, 2014). Thus, it prevents conflicts which may take place with the use of traditional manual/computer-aided drawing methods (Li et al., 2009).

1.1. Research Aim

BIM proficiently conveys project information and has helped tremendously in reducing the number of conflicts and errors that generally occur with traditional methods which require skilful coordination between project teams; which the most important aspect in Project Management. It should be noted that prior to BIM the construction industry was in desperate need of an information modelling system to reduce time delays, costs and risks associated with construction and project management activities as well as to improve collaboration among stakeholders. Some of the other keys advantages of using BIM are enhanced visualisation, design of constructions elements harmful to the environment and improved project integration.
The primary aim of this research project will be to investigate the extent to which the BIM has been able to support project management, and if it has the potential to influence Chinese construction market and the implications for project managers (It will also review eh extend to which this system is being utilized in this region - if any). Hence this research study intends to establish whether the use of BIM in the Chinese construction industry can help to shape up country’s sustainable future and to explore the opportunities it will present to the stakeholders, as it has presumably done in the developed countries?

1.2. Research Questions

1. How BIM has the potential to be the key to Sustainable Future? What is its scope in China?
2. To explore the opportunities it will present to all stakeholders in China from a project management standpoint?
3. To understand the causes of its underuse in China when other developed countries have employed it industry-wide to improve their profits and operations.

2. Literature Review

Building Information Modelling also commonly termed as Building Information Management is a system to present a building design solution by means of using virtual building information models. BIM also has the capability to maintain complete documentation of the building designs and processes and compare them with industry best construction processes. The definition of BIM as maintained by the Nation Building Information Model is given below:

“Building Information Modeling (BIM) is the digital illustration of both functional and physical features of a certain facility. This is the application of latest models of information and their application in the development of a certain facility which will end up with a reliable solution. The complete life cycle of the constructional process will be defined from existing to the latest solution along with their demolition procedures.”
The idea of sustainable constructions has gained tremendous popularity after higher levels of environmental pollution had an adverse effect on the lives of living beings. Thus, it was imperative to introduce a construction method that could help to mitigate the risks caused by traditional construction methods to the environment and also inspire improvement at the economic and social level. BIM is indeed a revolutionary creation with the potential to transform the Chinese construction industry. Some other researchers have also looked into the possibility of integrating BIM into Chinese construction projects to improve the overall sustainability of the projects to the desired levels (Ilhan & Yaman, 2014).

3. Research Methods

The researcher aims to make use of both primary and secondary data collection methods to complete this research study. The secondary data will be collected through the use of published articles, papers, books and case studies. The primary method through which the researcher intends to evaluate the extent to which the BIM is employed in the Chinese construction industry will be obtained through questionnaire and/or interviews. A questionnaire with appropriate questions will be designed by the author of this proposal paper and distributed among project managers, stakeholders, engineers and other industry professionals who have previously worked with BIM.

3.1. Data Sources

The researcher will be collecting the secondary data from various academic sources such as relevant government websites and directories, books from local libraries and electronic databases, journals, research articles and previously published research papers. On the other hand, the primary data will be gathered from relevant industry professionals and practitioners based in China. As such, the researcher aims to upload the questionnaire on an online portal such as Survey Monkey and share its URL link with the participants. Some of the participants will also be directly contacted via email or telephone calls if/when required. Interviews will be conducted on Skype and data will be recorded with a voice recorder. Interview transcripts will be used at a later stage to analyse the data.
3.2. Research Expectations

Essentially, the results of this research study are expected to answer whether the use of Building Information Modelling in the Chinese construction industry has the potential to lead the sector towards a sustainable future. The research is also expected to highlight the possible challenges that project managers may have to face in regards to the implementation of BIM in China due to the lack of appropriate BIM standards and regulations. Based on the findings of this research, recommendations and suggestions on how BIM can be successfully integrated into the Chinese market will then be provided.

4. Research Plan

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5. References


