

Mitigating Environmental Characteristics with Integrated Design and Automated Construction Approaches for AQH Development

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ABSTRACT

Industrialised Building Systems (IBS) implementation requires a systemic operational approach from conceptual design to implementation. In doing so, ensuring the movement of knowledge amongst the team members for a timely and within the budget implementation is a major concern because it impacts the long-term sustainability of the completed project. This study attempts to relate recent international findings to the Malaysian context, which recommended the need to look at the life span of property projects and proposing the development of tools and methodologies that could mitigate the knowledge-loss phenomenon. It found some similarities between housing development projects in USA with those of the local public projects. At the conclusion of this paper, it supports the recommendation for a systemic review of the local IBS delivery process by integrating 3D-CAD modelling during the housing development design process. The systemic IBS process is expected to promote a seamless transition towards 4D technology in the building phase.

Keywords: Industrialised Building Systems, Integrated Design,
Housing Development

1. INTRODUCTION

Industrialised Building System (IBS) implementation requires a systemic operational approach from conceptual design to implementation for the housing developer to take advantage of its financial benefits. In promoting IBS, the housing developer could also take advantage of ensuring the movement of knowledge amongst the team members for a timely and within the budget implementation. This building approach has been promoted by the government of Malaysia for the purpose of providing quality-controlled

end products through controlled prefabrication process and simplified installations. It is a construction process that utilizes techniques, products, components, or building systems, which involve prefabricated components and on-site installation (Zuhairi and Sarhar, 2003).

Another benefit as mentioned by the IBS Roadmap 2003-2010 states that IBS could provide faster completion of construction when builders use standardised prefabricated components and having the installation process simplified. The Construction Industry Master Plan 2006-2015 by the Construction Industry Development Board (CIDB) has a strategic plan to improve the effectiveness and productivity of the construction industry in Malaysia by facilitating the integration of ICT into the local construction industry (Zuhairi and Sarhar, 2003). Among the proposed priority areas for the strategic plan include electronic commerce of the design and fabrication processes, 4D (3D plus schedule) in architectural/engineering design, improved data sharing with flexible product model schemas, transaction performance measurements and project websites, and other project communication systems for remote teams (ibid.).

There are 5 priority areas for the local construction industry to innovate as outlined by the IBS Roadmap 2003-2010 (which eventually were adopted by the Construction Industry Master Plan 2006-2010). Firstly, is the adoption of new construction techniques and technology. Secondly, the development of manpower to support adoption of IBS/MC. Thirdly, continuous development of materials (components and machines) to support adoption of IBS. Fourthly, continuous enhancement of management processes and methods to encourage adoption of IBS. Finally, provision of monetary (economic and financial) support to encourage IBS adoption. The purpose of this study is focused on

