The Mechanisation and Automation of the IBS Construction Approach in Malaysia

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Abstract

The objective of the main research is to investigate the current state of implementation of mechanisation and automation in the Industrialised Building System (IBS). The aim of this paper however, is to provide an overview on the implementation of mechanisation and automation in the IBS construction approach. Questionnaire survey and semi structured interviews were conducted to collect the viewpoints among contractors and manufacturers of IBS to ensure the richness of the data collected. The results illustrated that although most respondents have agreed on most critical issues in the implementation of mechanisation and automation, they were not ready to move forward. These responses were quite consistent across the professions.

Keywords: Modern method of construction (MMC); industrialised building system (IBS); mechanisation and automation; environment.

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1.0 Introduction

The construction industry is widely acknowledged for its vital economic role and contribution to countries' GDP. In addition to this economic importance, the construction industry also accounts for a high political, environmental and social profile, which is attributed to its key role in providing housing, its impact on the construction environment, as well as being a major employer.

Industrialised Building System (IBS) is accountable for the significant reduction of wastages and reduction of the consumption of natural resources to preserve our environment. Jaillon et al. (2009) estimated that the average wastage reduction level due to the implementation of IBS is about 52%. As commonly agreed, conventional on-site work normally involves extreme activities on the site that cause constant nuisances to local communities such as messy environment, traffic chaos, noise, and air pollution (Yee, 2001). This is a rather remarkable rate compared to constructions without IBS operation. Therefore, construction practice, methods and material have continuously changed to fulfil nations' needs (Ngowi et al. 2005). The amount of raw material and natural resources used in construction for creating and operating the built environment are estimated to exceed those consumed in any other sector.

In Malaysia, as a result of the governments' initiatives in advancing the use of innovative technologies, the IBS approach is actively promoted through several strategies and incentives as an alternative to conventional building methods. The commitment of the government in encouraging the use of this approach can be seen with the development of the Roadmap IBS 2011-2015 published by the Construction Industry Development Board (CIDB) outlined several well thought strategies and aggressive steps to promote the use of IBS in Malaysia. The Roadmap was aimed to provide a quality, efficient, competent and sustainable IBS that contributes the competitiveness of the Malaysian construction industry.

The IBS can be described as a construction technique where components are manufactured on or off-site, transported and then assembled into a structure with the minimum of work. IBS is also considered as a Modern Method Construction (MMC). MMC is the term used to describe a number of innovations in house building in particular, and construction industry in general, mostly adopting offsite technologies by moving work from the construction site to the factory (Pan et al. 2007). Hence, MMC provides the opportunity for the players in the construction industry to develop a new image of the construction industry to be at par with other manufacturing industries such as the automobile and electronic. Furthermore, there has been a paradigm shift regarding MMC in Malaysia for the past few years whereby the industry has continually embraced new and modern technologies and methods that can increase the quality of its end-product, with faster speed of construction whilst coping with the issues of foreign workers. The Malaysian construction industry has faced unique challenges in practice and image in the past, and it is about time that it should be transformed into a modern and efficient industry.

Therefore, this study aims to provide an overview of the MMC in Malaysia towards the critical issues encountered during the process of implementing the mechanisation and automation approach. This study may complement precedent studies and assist players in