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IBS: An economic perspective on mechanisation and automation

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Abstract

Incorporating mechanisation and automation in the construction process is necessary to reduce production time and costs, improve working conditions, avoiding dangerous works, allow work to be performed where people cannot do, and eventually will increase performance, and product quality. This paper discusses a preliminary study on enhancing the quality of life by adopting Industrialised Building System (IBS) focusing on the economic perspective on the use of mechanisation and automation. The sustainability principles in the IBS have always maintained the harmony between environment and construction, improve human self-respect and encourage economic development to strive for a better quality of life.

Keywords: Economic review; industrialised building system; mechanisation & automation; sustainable construction.

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1.0 Introduction

To fulfill the government's aspiration to transform the Malaysian construction industry to modern construction system and accomplish the implementation of the IBS Roadmap and Construction Industry Master Plan (CIMP) 2006-2015, a proper and structured planning and implementation of mechanisation and automation approach for IBS should be established. In the year 2008, a circular from the Malaysian Treasury Department, Ministry of Finance denotes the policy on full utilization of IBS to be imposed for all government projects in Malaysian. The use of IBS components for government projects must not be less than 70% (Kamar, 2009) based on a scoring system. Although the construction industry contributed only around 3% to the Gross Domestic Product in the year 2010, it makes valuable portion of the Malaysian economy. Therefore, the construction industry could be described as a substantial economic driver for Malaysian. This is in line with Brandt (2012) who stated that in the year 2011, the construction- related cluster expanded by 14.7% (2010: 18.9%) and was a substantial contributor to the growth of the domestic-orientated industries. The total population in Malaysian was last recorded at 28.9 million people in the year 2011 from 8.1 million in 1960, a 255 percent increase during the last 50 years (source from World Bank). It shows that, there is no short of the increasing demand and need for the construction of buildings and infrastructures. The increase in population and economic growth also demand an improvement in the quality of life (thus the purchasing power) of the population. For instance, the demand for residential buildings alone in Malaysian between the years 1995 and 2020 has projected to be around 8,850,554 units (including 4,964,560 units of new housing units) in the light of the increase in population (Yoke et. al., 2003). AlAghbari (2004) found out that there are 709,400 units to be constructed in the period of 2005 -2010.

Therefore, the quality of buildings to be constructed and completed is the most significant factor in the delivery process of buildings for the population. By comparison, the traditional method of construction which is on site or in-situ based for fabrication, installation, and construction has founded to contribute certain negative effects on sustainable construction. However, IBS construction approach, quality assured and is environmental friendly because most vital activities or components done off-site. Construction industry has started to embrace IBS as a method of attaining better construction quality and productivity, reducing risks related to occupational safety and health, alleviating issues for skilled workers and dependency on manual foreign labour, and achieving the ultimate goal of reducing the overall cost of construction. Apart from this, it offers minimal wastage, fewer site materials, a cleaner and neater environment, controlled quality, and lower total construction costs (Pan et al. 2008, Hamid et al. 2008 and Pan et al. 2007). In the end, not only that IBS is submitting to sustainable construction, it also produces quality assured products that will hopefully leads to better quality of life.

1.1 Overview IBS in construction industry

Industrialised Building System (IBS) as it is called is the term coined by the industry and government in Malaysian to claim the adoption of building industrialisation and the use of prefabrication of components in building construction. IBS is defined as a construction technique in which components are manufactured in a controlled environment (on or off-site),