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Industrialised Building System Modular System (IBSMS) Organisational Readiness Framework

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Abstract

Off-site prefabrication and modern method of construction (MMC) has proven to promote sustainability in the construction industry that improve human sociology, foster economic development and environment stability. Modular construction is an innovation in the Malaysian construction industry. This paper discusses the study on IBSMS Organisational Readiness Framework for modular construction implementation through IBS approach in Malaysia. The study explored and identified the readiness elements and criteria as the main components of the framework. Through the framework, organisations that execute modular construction or IBSMS will be well prepared and ready to execute modular construction efficiently, thus improving Malaysian construction industry.

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Keywords: Industrialised Building System (IBS); Industrialised Building System Modular System (IBSMS); modular construction

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1. Introduction

Industrialised Building System Modular System (IBSMS) is the rebranding of modular construction to suit and adapt to the IBS approach in the Malaysian construction industry. IBSMS is a process to construct a building using modular or three-dimensional units; mass produce offsite in a manufacturing facility that highlighted the importance of design, manufacturing and construction elements in the process. These modular units are mass produced using the same materials and design to the same standards that increase the construction speed. It includes the assembly and logistic aspect of it done in proper coordination through detailed planning and integration (Musa, et al., 2014). The implementation of modular construction is proven to improve productivity, economically and promotes sustainability of the construction industry.

Modular construction is classified as off-site prefabrication and modern method of construction and used in developed countries such as US, UK, Japan and Australia due to its benefits. Thus, it is essential for the Malaysian construction players to be well prepared and ready to implement modular construction since Malaysia is moving towards achieving develop country status. Industrialised Building System (IBS) is the terminology to represent the prefabrication concept in the Malaysian construction industry. The move to introduce modular construction is to be expected because of modular construction's features to eliminate IBS limitation. Since IBS is already established in Malaysia, thus it is essential for modular construction to adapt IBS approach to ensure the effectiveness of modular construction implementation in the Malaysian construction industry.

Modular construction and IBS promotes sustainability in the construction environment that will develop and enhance the quality of life (Mohammad, 2013; Musa, Mohammad, Mahbub & Yusof, 2014), Modular construction and IBS contributes to sustainability by reducing damages to the environment, improve social relationship amongst the construction players and contribute to economic sustainability. Modular construction enhances the quality of construction products, reduces wastage and reduces the project duration. Thus, it is essential that modular construction and IBS to be well implemented and executed so that it can contribute to the enhancement of the quality of life. Therefore, through strategic planning, IBSMS organisational readiness framework needs to be developed to ensure the efficient implementation of modular construction and IBSMS in the Malaysian construction industry. IBSMS and modular construction will be introduced in the Malaysian construction industry by Construction Industry Development Board (CIDB). Hence, it makes this study and framework essential to the future development of the Malaysian construction industry.

Although the advantages and potential of modular construction are well documented, the implementation and execution process requires appropriate strategic planning to realise the potential of modular construction. One part of the strategic planning is to outline the readiness criteria or variable needed for an organisation to execute or adopt modular construction. It is crucial for an organisation or people in the organisation to be well prepared and ready to implement modular construction, to ensure the efficient delivery of modular construction.

2. Literature review

IBS is the terminology to represent prefabrication concept in the Malaysian construction industry. IBS introduced in Malaysia since the 1960s mainly to speed up construction projects and reduce the usage of foreign workers working in the Malaysian construction industry. Thus, the government has promoted the use of IBS through government projects whereby 70% IBS usage in a government project. IBS is a construction process that uses standardised building components mass produce in a factory or site then transported and assembled into a structure using appropriate machinery and equipment with minimal workers with proper planning and integration (Musa, Mohammad, Yusof & Mahbub, 2015). In the other hand, modular construction is a worldwide off-site prefabrication or manufacturing of 3-dimensional units' concept. Modular construction was developed since the 1940's, during the World War 2 as a solution for the soldier's accommodation. Modular construction is a construction method to produce a building using three-dimensional modular units or modules, mass produce off-site in a manufacturing facility. It includes the logistic and assembly of it, done in proper coordination with through planning and integration (Musa, Yusof, Mohammad & Mahbub, 2014). Even though, modular construction is well established globally, but it is essential for modular construction to adapt to IBS approach. It is to ensure the efficiency of modular construction implementation and delivery in the Malaysian construction industry.