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## Towards Improving Integration of Supply Chain in IBS Construction Project Environment

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### Abstract

Although efforts exist to enhance IBS practice in Malaysia, establishing integration between IBS players is still a major hindrance. To ensure the success of IBS construction, the research will look at the integration means and factors that helped to integrate the IBS supply chains. Findings from semi-structured interviews with key IBS supply chain players revealed, human and behavioural factors, supply chain process and exchange flow, supply chain structure and collaboration and the working environment should be developed amongst the IBS supply chains. The findings contribute enabling factors to improve integration within IBS supply chains in the construction environment in Malaysia.

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*Keywords:* Construction environment; industrialised building system; integration and supply chain

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## 1. Introduction

Current construction practices in the Malaysian construction industry play a critical role in the successful delivery of projects. While challenges often occur in the area of productivity, efficiency, quality and the delivery of work, the establishment of the Construction Industry Master Plan (CIMP) has led to initiatives in the implementation of innovative approaches through Industrialised Building System (IBS) towards sustainable construction environment. According to Isnin et al., (2012), sustainable construction environment highly demand a high-level of skills and technical techniques. Thus, IBS is a strategy for transforming the construction industry into an industrialised sector that deals with prefabricated components with highly technical skills and techniques. There are numerous benefits to and drivers in IBS; however, it raises challenges that need to be overcome, mostly related to the supply chains and integration (AbdShukor et al., 2009; CREAM, 2009). One of the most crucial problems in IBS is: Lack of supply chain integration and togetherness. Supply chain integration issues pose the main hindrance in IBS construction project environment despite new regulations and a government-led drive to enhance quality and performance of IBS in the Malaysian construction industry. IBS requires a high level skill, technical techniques, coordination and integration of supply chains (Mohammad et al., 2014), thus, the industry should change to enable improvement to take place and move towards more integrated and innovative ways of working practices. The fragmented and adversarial nature of the construction industry extensively influences the performance and the characteristics of construction supply chains and affects the integration of the supply chain. Thus, the integration of supply chains is seen as an effective tool to integrate the fragmented industry, and it can be deduced the integration of supply chains in IBS construction project environment is seen as more vital (Du, 2006; Vrijhoef, 2011). To ensure the success of IBS projects, integration should be developed amongst the supply chains and the construction supply chains involved need to understand the means and dimension factors in improving integration in construction..

## 2. IBS construction environment and supply chain integration

In the Malaysian construction industry scenario, the early developments of IBS occurred and took place in the 1960s. Thanon et al. (2003) noted that IBS in Malaysia was initiated through two pilot projects in JalanPekeliling, Kuala Lumpur, and Rifle Range, Penang, with a series of 17- and 18-storey flats. Since then, many systems were introduced and numerous projects have utilised IBS systems. Then, the importance of IBS was highlighted under Strategic Thrust 5 of CIMP and being reinforced in 2003-2010 (1st phase) and 2011-2015 IBS Roadmap. In line with this paradigm, the introduction of IBS struggles to expedite the CIMP vision and eventually contribute to the performance of the construction industry. However, even though the re-introduction of the IBS construction method has long been introduced and has promised to solve and improve the current construction process, these practices have still contributed to project delay and resulted in a bad reputation (CIDB, 2010; Rahman & Omar, 2006). In addition, it faces a difficult task in establishing the integration and coordination between parties in the construction supply chain (Hamid et al., 2008). Hsieh (1997) and Shamsudin et al., (2013) mentioned that the adoption of IBS also requires more fundamental changes to the conventional working practices and the relationship amongst the players due to industrialised construction. Thus, to enhance the level of adoption of IBS to be successful with any approach aimed at creating industrial structures in the construction industry, it must not only look at the hard aspects, but extend beyond to the soft aspects of management. There was a strong belief that integration supply chains and industrialisation was the key to better building production and was very significant and important for improving and addressing the performance and productivity of the construction industry with the goal of being more integrated. In relation to this, the Malaysian Government has been persuaded to employ the innovative approach of IBS and integrated supply chain in order to steer the construction industry in the right direction (CIDB, 2007). Therefore, keeping in mind the importance of improving the integration of the supply chain in IBS implementation, its means and dimension success factors should be considered and acknowledged in order to persuade the construction industry to engage in a more systematic and strategic approach to IBS construction, especially in respect of the fragmented supply chains.

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