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Business Strategy of Small and Medium-Sized Enterprise Construction Companies in Adopting Industrialised Building System in Malaysia

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Abstract

This exploratory study outlines the business strategy that are being applied by small and medium-size enterprises (SME) construction companies in adopting Industrialised Building System (IBS) in Malaysia. Case study was employed as the research method in order to achieve the research objective as it can be used to explore and give further understanding of the research issues. Cross-case synthesis and pattern matching technique were applied for the analysis of the case study. Through the study, it was found that the SME construction companies could participate in the IBS business. The companies need to have capital and knowledge in IBS, position themselves as a total IBS solution provider to clients, target projects with large volumes of building components, employ a small number of fulltime employees as well as to have in-house capability and to outsource some facilities in the business operation. In conclusion, the involvement of SME construction companies in the IBS market is important to avoid the monopoly of IBS components supplies among the large companies and to potentially reduce the price of IBS so that it becomes more affordable to be used in the construction projects.

Keywords: Industrialised Building System, Precast Concrete System, Business Strategy, SMEs, Contractor, Manufacturer

Introduction

The construction industry demands active construction organisations, efficient construction processes and innovative construction techniques (Rashid, Abdullah, & Ismail, 2019), and Industrialised Building System (IBS) is seen as a suitable construction technique to be used to fulfill the demands. IBS is a construction technique in which the components are manufactured in a controlled environment whether on or off site, transported, positioned and assembled into a structure with minimal additional site work (CIBD, 2003). The term is

used by the Malaysian construction industry and government to represent the prefabrication of building components in Malaysia (Kamar et al., 2012). IBS can be classified into six main categories which are; pre-cast concrete system, steel framing system, timber framing system, block work system, formwork system, and innovative system (CIDB, 2016; Din et al., 2012). There are many benefits of using IBS as reported by researchers worldwide that give advantages to the IBS adopters (Alinaitwe, Mwakali, & Hansson, 2006; Bhattacharjee, Pishdad-Bozorgi, & Ganapathy, 2016; Blismas, Pasquire, & Gibb, 2006; Gibb & Isack, 2003; Goodier & Gibb, 2007; Hanafi, Abdullah, Razak, & Nah, 2015; Haron, Abdul-Rahman, & Hanid, 2009; Hung, Hamid, Din, & Norman, 2015; Jabar, Ismail, & Mustafa, 2013; Lou & Kamar, 2012; Majid et al., 2011; Na & Roger, 2008; Polat, 2008; Samari, Ghodroti, & Shafiei, 2012; Zhang, Lee, Jaillon, & Poon, 2018). These benefits include certainty in project cost and time, better quality and productivity in construction, reducing the risks related to occupational safety and health, alleviating the issues of skilled worker shortage and dependency on manual foreign labours, as well as achieving the ultimate goal of reducing the overall construction cost.

Owing to these benefits, the government has been aggressively championing the use of IBS in the public and private projects. In 2008, all government projects have been made compulsory to use IBS where a minimum of 70 IBS score must be achieved for project worth RM10 million and above, as stated in Treasury Circular SPP 07/2008. Whereas for private projects especially residential building, the construction players are encouraged to use IBS, as contractors achieving 50 IBS score are entitled to get a levy exemption from the Construction Industry Development Board (CIDB) (Hamid et al. 2008). However, the adoption rate of IBS was very low, where only 24 percent of the targeted government projects have achieved 70 IBS score in 2015 (CIDB, 2015). In order to solve this issue, the government has introduced the Construction Industry Transformation Plan (CITP) 2016 – 2020, which consists of six specific productivity-related initiatives and IBS is listed under Initiative P3 (accelerate adoption of IBS, mechanization and modern practices). Through the CITP 2016-2020 initiatives, the percentage of government projects that have achieved 70 IBS score has reached 69.4 percent in 2016 and further increased to 77.8 percent in 2017, with a total number of 1578 out of 2101 projects. This rate is expected to grow until the year 2020. (CIDB, 2017; Ahmed, Khalid, Ammar, & Shah, 2017).

Although the government managed to increase the IBS adoption rate, yet the upsurge of IBS implementation in the Malaysian construction industry has adverse effects on the small and medium-sized enterprise (SME) construction companies in the construction market (Goh & Loosemore, 2017; Mohamed et al. 2018). SME construction companies are really concerned that this development would reduce their business opportunities (Theong, Rashid, & Chai, 2018) as the participation of SME especially Bumiputra contractors in IBS is very low (CIDB, 2015). There will be a reduction of on-site activities and the number of on-site trades such as carpentry work, bricklaying, bar bending and other manual on-site jobs (Kamar, Azman, & Nawati, 2014). Due to these problems, there is a need to thoroughly examine the roles of SME contractors in the IBS supply chain. The SME contractors need to participate in the IBS market in order to support the adoption of IBS in Malaysia. Thus, the aim of this paper is to outline the business strategy of SME construction companies that have successfully adopted IBS in their construction business. The strategy may be used as a preliminary initiative to guide other SME construction companies to move from conventional construction towards IBS.

Literature Review

Small and medium-sized enterprises (SMEs) in the construction industry can be classified according to the number of fulltime employees or annual sales turnover. For contractors, it can be categorized according to the registration grades as shown in Table 1. SME contractors are at the core of the Malaysian construction industry with 90 percent registration rate, while large contractors make up the remaining 10 percent (CIDB, 2015; Kamal & Flanagan, 2012). CIDB (2017) reported that the number of SME contractors in the construction industry was at 74,826 in 2017. Yet, the majority of SME contractors especially Bumiputera contractors have relatively low productivity level where the specialisation remains low. This was demonstrated by the small number of Bumiputera contractors registered with specialist trades expertise, especially in growth areas or in areas that will be in high demand as a result of projects planned under the Eleventh Malaysia Plan (11MP) 2016 - 2020 (CIDB, 2015). According to Kamal & Flanagan (2012); Ahmed, Majid, & Zin, (2016), the main challenges faced by the SME contractors are the ability to absorb new knowledge and technology, and to implement it into construction projects. Many SME contractors are reluctant to adopt IBS but prefer to continue using the conventional method of construction mainly because of familiarity with the conventional system. For them, the technology suits well with small-scale projects and therefore they are not willing to switch to a mechanized system (Rahman & Omar, 2006). In order to survive in the construction industry, SMEs need to have some degree of involvement in IBS projects (Theong et al., 2018). Kamar et al. (2014) and Theong et al. (2018) suggested that SME contractors to become IBS product vendor or installer, as this does not involve high investment capital. But in order to be more successful and profitable in the IBS market, SME construction companies would need to become IBS contractors or IBS manufacturers. In doing so, they require a business strategy to guide them.

Table 1: Definition of SMEs in construction

Type of enterprise	Definition	Contractor Category
Microenterprise in services	Is an enterprise with full-time employees of less than 5 or with annual sales turnover of less than RM200,000	G1
Small enterprise	Is an enterprise with full-time employees of between 5 and 19 or with annual sales turnover between RM200,000 and less than RM 1 Million	G1-G3
Medium enterprise Definition	Is an enterprise with full-time employees of between 20 and 50 or with annual sales turnover of between RM 1 Million and RM 5 Million	G4-G5

Source: CIDB Malaysia

The reasons construction businesses exist today are to make money and to have optimum business returns, and therefore business strategy is essential for the success of the company (Lou & Kamar, 2012). Porters (1996) defined strategy as the creation of a unique and valuable position, involving a different set of activities. On the other hand, Thompson et al. (2006) defined strategy as management’s game plan for growing the business, staking out a market position, attracting and pleasing customers, competing successfully, conducting operations, and achieving targeted objectives. Effective strategy enables construction firms to match their activities to the changing environment and to achieve superior performance in the competition (Tan, Shen, & Langston, 2012). Embracing IBS requires a strategy in business, as it is important especially in assessing the viability of the project (Lou & Kamar, 2012). In order to adopt IBS, SME contractors need to have a strategy in their businesses since IBS is different from conventional construction. The business strategy elements used for this study is adapted from Kamar et al. (2012) as it relates to the definition by Porter (1996) and Thompson et al. (2006). It consist of five elements; business entry, business positioning, market target, business structure and business operation as shown in Figure 1.

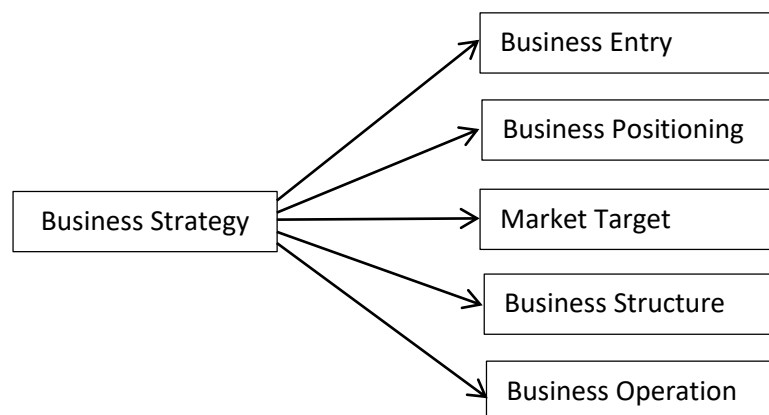


Figure 1: Business strategy elements (Kamar et al., 2012).

Methodology

This study is exploratory in nature and uses case study as the research method. The objective is to acquire information on the approaches of Malaysian SME construction companies in adopting IBS. The use of case study is to allow for exploration and understanding on the research issues, as it can be considered a robust research method particularly when a holistic, in-depth investigation is required (Yin, 2014). The case study is used in this paper to highlight the current business strategies implemented by the SME construction companies involved in IBS. The analysis is based primarily on cross-case synthesis and pattern matching technique. Semi-structured interviews were designed and used in the case study to obtain detailed and complex answers from the interviewees, which involved the company's director and senior managers as the respondents. The reason for the respondent selection is to ensure the reliability of information gained for this research. The data collection was performed between the months of January 2019 and February 2019 and besides the interviews, factory visits have also been conducted.

Case Study Report

The samples for this research were three local SME construction companies which include IBS contractor and manufacturers that have successfully adopted IBS in their businesses, labeled as company A, B and C. The respondents for company A and C were the company's director, while for company B the respondent was the senior operation manager. The case study reports were developed based on the semi-structured interviews, factory visits and reviews of the companies' profile, and were summarized according to the business strategy elements applied in this study. Below are the case study reports for the three companies:-

Company A

This company is an IBS contractor registered under grade G3 with CIDB, with the office located in the state of Selangor. The company can be classified as small enterprise as it has 13 fulltime employees. In 2009, the company started as a contractor specializing in the installation of precast concrete components. Then, in 2015 the company developed into an IBS manufacturer for an on-site precast concrete components manufacturer whereby the precast components were produced at the project's site as shown in Figure 2 for instance. Currently, the services provided by the company include IBS design, manufacturing of IBS components and installation. The IBS products offered by this company are precast concrete wall panel as well as precast framing system, which includes column, beam and slab. The volume of work are very important for the company as IBS construction requires standard and repetitive building components in order to be profitable and to get the return on investment in a short time. Due to this reason, the company targets and undertakes only public projects such as school, hospital, custom office and universities, as these types of building would usually have a large volume of repetitive building components. Besides IBS, company A is also involved in civil construction business.



Figure 2: The onsite prefabrication yard (Courtesy: Company A)

Company B

This company is an IBS manufacturer registered with CIDB, with an IBS factory located in the state of Negeri Sembilan. The company was officially incorporated in June 2010 and is a subsidiary of a large construction company, currently with eight fulltime employees. The annual turnover of the company is around RM 5 million, and therefore it is classified as a medium-sized enterprise. The services provided by the company are IBS design consultancy, prefabrication of IBS components and installation. Company B also collaborates with CIDB to conduct several training programs, which is held inside the factory. The company commenced its factory with only the prefabrication yard and an office cabin. Then, in 2009, the company invested in IBS business where they started to acquire machineries and equipment for better manufacturing quality of the IBS products, and currently the factory's average production capacity can achieve up to 3,000 m³ per year. The company specialised in precast concrete system and they offer all types of precast concrete components such as concrete framing system, wall panel, slab, staircase, etc. Company B has penetrated both public and private projects as their main target market and undertaken projects such as school, higher education buildings and residential projects. The large volume and repetitive design in public buildings would literally pay off their earlier investments of setting up the prefabrication facilities.



Figure 3: The offsite prefabrication factory facilities (Courtesy: Company B)

Company C

Company C is an IBS manufacturer registered with CIDB and located in the state of Pahang. The company is a subsidiary of a G7 construction company with 20 fulltime employees with an annual turnover of RM 5 million in 2018. Based on the number of fulltime staff and the annual sales turnover, the company is classified as a medium-sized enterprise. Company C is an onsite manufacturer of precast concrete components and has been incorporated in 2015 with the aim of strengthening the IBS market and construction industry in Malaysia. The company acts as a one-stop centre providing a whole range of solutions including conceptual as well as detailed structural design, detailing and shop drawing, cost optimization, installation and other site services. The products manufactured by company C include precast columns, beams, slabs, staircases, loadbearing walls, facades, bridge beams, parapets, U-drain, culverts, sleepers etc. The company targets both public and private projects and has well positioned themselves to serve both the building and infrastructure construction industry with their knowledge, products and services.

Analysis and Discussion

Business Entry

Through the interviews, it was learnt that the three case companies did not change their businesses from conventional construction towards IBS, but have adopted the IBS business right from the beginning. Company A started as precast installer and later developed into IBS manufacturer, while company B and C were registered as IBS manufacturer ever since its establishment. According to all of the respondents, “knowledge and capital investment in IBS is highly important to enter into IBS business especially at the early stage of the adoption”.

Business Positioning

All case companies positioned themselves as total solution provider of IBS that offer in-house design service, manufacturing and installation service to clients. However, the companies also outsourced some of the facilities and equipment to enable the IBS implementation. According to the respondents from company A and B, “in order to position well in the IBS market, they need to become a total solution provider to clients but sometimes they only offer a few services as required by the clients”.

Market Target

Company A targets only public projects due to security of payment, according to the respondent of the company, and their unpleasant experience working in private projects. Furthermore, the demand of IBS in public projects is higher compared to private projects due to the government’s policy. On the other hand, company B and C target both public and private projects. In general, the volume of work are very important for all the three companies and they favor projects that require the use of a large volume of standardized and repetitive building components.

Business Structure

Since the three case companies are classified as SMEs, the business structure of these companies are considerably simpler compared to large organizations. Company A is a standalone entity comprising 13 fulltime employees, while company B and C are subsidiary of large construction companies with 8 and 20 fulltime employees respectively. This shows that

IBS business does not require too many work force in the company. Generally, the employees' education background are civil and structural engineering, mechanical engineering, quantity surveying and construction management.

Business Operation

The case companies have in-house capability in design, manufacturing and installation of their precast products. However, company A and C do not have a permanent factory to perform the manufacturing works, but a mobile factory as shown in Figure 2 which is commissioned on project basis to save on logistics costs. The two companies only owned the lightweight and small equipment required to do the casting works, for example the formwork equipment. On the other hand, heavy machineries such as lorry for logistics at site and lifting machineries such as crane will be outsourced. Meanwhile, company B has a mechanized factory located in an accessible location in Negeri Sembilan. This company owned not only lightweight and small equipment but also heavy lifting machineries such as gantry cranes as shown in Figure 3. This company only outsource heavy logistics machineries for the delivery of precast products to the construction site.

Table 2: Synthesis matrix table from the case studies

Element/Company	Company A	Company B	Company C
Business Entry	Started as precast installer and later developed into onsite manufacturer	Started as IBS manufacturer from the beginning	Started as IBS manufacturer from the beginning
Business Positioning	Total solution provider to clients (design, manufacturing and installation)	Total solution provider to clients (design, manufacturing and installation)	Total solution provider to clients (design, manufacturing and installation)
Market Target	Public projects and targets large volume building components	Public and private projects and targets large volume building components	Public and private projects and targets large volume building components
Business Structure	Standalone entity with a small number of fulltime employees	Subsidiary of a large construction company with a small number of fulltime employees	Subsidiary of a large construction company with a small number of fulltime employees
Business Operation	In-house capability in design, manufacturing and installation, while outsourcing heavy machineries for onsite manufacturing and installation works.	In-house capability in design, manufacturing and installation with own mechanized factory, while outsourcing heavy logistics machineries for the delivery of IBS products to site.	In-house capability in design, manufacturing and installation, while outsourcing heavy machineries for onsite manufacturing and installation works.

Conclusion

The increasing IBS adoption in the Malaysian construction industry is perturbing the SME construction companies especially contractors as it is potentially causing adverse effects on

their business opportunities. The use of IBS would reduce many on-site activities and the number of on-site trades such as carpentry work, bricklaying, bar bending and manual on-site jobs. The number of SME contractors is higher compared to large contractors where the conventional projects are not enough for all of them. In order to sustain their businesses, SME construction companies would need to support the adoption of IBS in Malaysia by participating in the IBS market. The purpose of this paper is to explore the business strategy of SME construction companies that has successfully adopted IBS in their business. In order to adopt IBS, SME construction companies need to have capital and knowledge in IBS, position themselves as a total IBS solution provider to clients, target projects with large volumes of building components, employ a small number of fulltime employees as well as to have in-house capability and to outsource some facilities in the business operation. The involvement of SME construction companies in the IBS market is important to avoid the monopoly of IBS components supplies among the large companies and to potentially reduce the price of IBS so that it becomes more affordable to be used in construction projects.

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