

BUSINESS CREATION BY INDUSTRIALISED BUILDING SYSTEM IN MALAYSIAN CONSTRUCTION INDUSTRY

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ABSTRACT: Recently, the Malaysian government had been developing new technologies to the construction industry and one of them is the Industrialised Building System (IBS). The government urged that IBS is 100% utilized in all construction projects. It is believed that the application of IBS helps in reducing construction duration and cost, solving the problems of overflow of foreign workers in the site and improving performance and appearance of a structure. However, there are some parties like the contractor who feel reluctant to utilize this system because there are risks. They worry that their trades will be affected as IBS construct a structure using components which are manufactured in a factory and assemble on site. Therefore, this research is to find out whether IBS benefits the country's economy by focusing on the business created by investing in IBS. A comprehensive supply chain for IBS will be developed to compare with the traditional construction supply chain as to determine businesses or trades created and eliminated. This paper is looking at the theoretical framework about business opportunities due to the Government policy on embarking IBS.

Keywords: Industrialised Building System, business creation, supply chain.

1. INTRODUCTION

Businesses generated from the construction and building activities enable the construction industry to be one of the contributors to the nation's Gross Domestic Product (GDP). Contractors, sub-contractors, material suppliers, manufacturers and professional firms have tight relationship among themselves as the parties depend on each other either partially or fully in order to complete a structure. Business opportunities are available when the construction industry booms and hence, income generated is increased. Currently, the Malaysian contractors are required registered under the Construction Industry Development Board (CIDB) or Pusat Khidmat Kontraktor (PKK).

In the construction industry, businesses are also created for the manufacturers. According to the Malaysian Industrial Development Authority (MIDA), manufacturers who are involved in the industry include those categorized in wood, non-metallic, basic metal, fabricated metal products and machinery manufacturing. Based on the latest statistics issued out by MIDA, the number of manufacturing projects approved for the construction industry is 35% of all the industries where as the investment by the Government is quarter of the total investment.

The traditional wet construction method which has been part and parcel of the Malaysian construction

industry involves thousands of manual workers such as the carpenters, plasterers and brick layers. It offers employment to numerous of independent design and management firms, construction companies, trade and specialist sub-contractors and many suppliers. However, many criticisms have been directed towards this method of construction. Apart from extensive construction period, the quality is always below expectation, the site condition is not conducive and the coordination is often lacking. Today it has become the reason for the large influx of foreign workers into the country, with many of them entering the country illegally.

To overcome the dissatisfactions on the traditional construction method, the government of Malaysia together with its agency, CIDB has been aggressively pushing the construction industry to the use of the Industrialised Building System (IBS) method of construction since 2003. This is proven when IBS Roadmap 2003 – 2010 was published by the Government to guide the practitioners, agencies, professional bodies with the strategies and implementation plan.

All definitions of IBS mentioned in the literatures are about the prefabrication, off-site production and mass production of building components before assembling on site. CIDB considered a project as an IBS project when the usage of IBS content reaches 70% for government building and 50% for private sector building. Therefore, in the Malaysian

construction industry context, IBS is a method of construction utilizing 50-70% of prefabricated elements which will be transported to the site for assembly purpose to minimize the on-site activity and this actually not only contributes to the growth of the construction industry, but also that of the manufacturing sector.

According to Kamarul and Zuhairi (2009), the fundamental of IBS is to move some effort away from the construction site to a more controlled environment of the manufacturing floor. IBS has been introduced to cope with a growing demand of affordable housing, solving issues associated with foreign labours and improving image, quality and productivity of construction industry in Malaysia (Hamid et al, 2008). According to Lim (2006), one of the main barriers to impede the growth of IBS are the resistance from the various parties involved like contractors as their involvement will be reduced when most responsibilities are taken over by big manufacturers.

Hence, we need to find out whether businesses are reduced or created when the industry moves to IBS adoption. The paper analyses and discusses the issues based on the supply chain concept.

2. ISSUES

The foregoing discussion highlighted the aims of introducing IBS. Anyway, we need to focus on other point of view which may lead us to many questions. For example, we may find out whether IBS helps in boosting Malaysian economy by increasing local employment and business opportunities.

The conventional construction which is a common practice in Malaysia is labour intensive and requires many wet trades on site such as skilled carpenters, plasterers and brick layers. The process can hamper by quality issue, unfavourable site condition, skilled labour shortage and bad weather conditions (Zuhairi et al, 2009). What is the situation for IBS? Will it reduce or increase the trades and solve the problems faced in the traditional construction? What are the trades that are involved in IBS method of construction? Is the system enhancing more businesses and generating more income to the nations?

According to Yourse (2002), the current IBS companies in Malaysia can be classified into 6 different interrelated areas of business activities. However, the major 3 areas of business are building product manufacturing, main supplier of building materials and main contractors involved in the actual construction. The other 3 areas of business are sub-contractors, consultants and client. In year 2007, there are a total of 108 IBS manufacturers and 851 IBS contractors out of more than 60,000 contractors

registered with CIDB (CIDB, 2008). From these figures, is IBS creating new business opportunities to us? By adopting IBS in the projects, how many local companies are involved? What are the implications on traditional trade contractors?

By theory, IBS promotes innovation to the construction process and its value chain, produces new range of products and services, and also offers new businesses to the market (Kamarul and Zuhairi, 2009). The question arises is the overall businesses in the construction industry will increase or decrease after the traditional trades being eliminated and replaced by new enterprises?

Director General of the Malaysian Timber Industry Board (MTIB), Associate Professor Dr Jalaluddin Harun Said said that the timber industry can participate in the implementation of IBS either as the producer, fabricator, transporter or provide consultancy services to those utilizing wood (BERNAMA, 2009). The issue is will this brings benefits the current construction players by producing more business opportunities to them? Or will there be more manufacturers setting up business to produce timber components for IBS projects?

Based on all the questions arose, it is important to find out whether IBS gives rise to new businesses creation or it causes the death of business in the industry. Hence, the main issue of this paper is by implementing IBS to the construction field, to what extent it could generate wealth to Malaysia? How much wealth in terms of business can be generated by this system? By answering the questions, we are able to ascertain the businesses opportunities created by IBS.

3. BUSINESS CREATION IN THE CONSTRUCTION INDUSTRY

As claimed, IBS is introduced to speed up construction duration and reduce the number of labours in the country, but will it affect the current business cycle? Will this new method reduce business as well as job creation? Businesses or firms help in the growth of economy in a country. Therefore, it is apt to clearly define the meaning of business and spell out the factors which stimulate the creation of business in an industry.

Based on the definitions given by the Business Dictionary, Danny (2004) and Rolf and Sander (2005), 'business' or 'firm' is basically an entity meant for gaining profits by producing goods and services with the combination of factors of production such as capital and cost, labour, material and facilities. In this case, business is very much linked to entrepreneurship as both of them share the similar factors of production in generating sales.

Hence, creation of business can be clearly defined that it is the formation of firms by the entrepreneurs or business owners. The construction industry is concerned with one-off projects which carried out by different short-term teams that are formed by various parties like designers, contractors, sub-contractors and suppliers. These parties are related to construction business as the firms gain profit by carrying out activities to assemble structures in the industry.

Elements that affect the creation of business include national economic conditions, innovations and motivations of new products, financial support, science and technology, market conditions and also education level (He´ bert and Link, 1989; Rolf and Sander, 2005; Rajan and Zingales, 1998; Claudia and Javier, 2002; Reynolds and Curtin, 2008; Charles and Louis, 1995; Douglas and Dan, 2009 and Reynolds, 2010). It is vital to find out whether the introduction of IBS to the construction industry offering all the factors listed in the establishment of firms.

In the context of national economy, Malaysia’s economic growth decelerated 8.9% in year 2010 because the global economy was softened. The Malaysian Institute of Economic Research however commented that it will be gradually recover in year 2011 with strong domestic demand and investment. In fact, manufacturing sector dominates again. IBS is considered as a new product innovated in the construction industry. It is part of the development of science and technology which requires knowledgeable manpower to apply it in the industry. With claims that IBS would overcome the issues of overflowing of foreign workers, the Malaysian government has been very supportive in the utilization of IBS method of construction. Emphasis had been given to most government projects recently where 70% of the building elements must be off-site manufactured and assembled on site. Currently, low IBS construction components available in the market even several incentives are introduced to IBS related businesses. Most contractors feel reluctant to change their business practice.

As in other technological driven method, it will alter the traditional way of achieving targets which will directly and indirectly change the project organization, business practice and supply chain. Similar to IBS, it undeniably changes the existing business scenario in the industry. In this case, with the current national economic condition, market response, education level and government support, is this innovated construction method creating or eliminating businesses?

4. IBS AND CONSTRUCTION BUSINESS SCENARIO

From all definitions by different literatures, construction is considered as a process which combining materials, plants, human resources to produce a permanent structure. It is happened when there are linkages of all the companies involved from the initial stage of a project to the completion product.

As defined, the construction industry forms a network of firms which undertake a project. The companies link each other by business through selling or renting products and services. The construction process is divided into a number of professional stages as set out in Table 1.

Table 1: Parties Supplying a Construction Project (Danny, 2004)

Parties Involved in Supply	Responsibilities
Architects and Designer	Provide specialist advice concerning structural, electrical, mechanical and landscape details. Identify key specifications
Project Manager	Manages project in detail. Liaises between the client and the construction team.
Cost Consultant	Prepare bills of quantities, cost plan, etc.
Main Contractor	Manages work on site
Sub-contractors	Supply specialist skills
Suppliers	Provide building materials and related components

Currently, the Malaysian contractors are required registered under the CIDB or PKK if the contractors intend to undertake government projects. CIDB classified the contractor firms as shown in table 2.2 which explains that G7 refers to big companies that are having the most paid-up capital and so, they are eligible to tender for any projects. Whereas, G1 contractors are the smallest-sized firms that are only eligible to tender for jobs that are not exceeding RM200,000.00. Based on the records by CIDB in both year 2009 and 2010, Grade 1 contractors stand almost half of the overall number of registered contractors. So, it can be said that most of the contractors are consider as small businesses.

Only contractors who have registered with CIDB IBS centre can tender for IBS projects. As recorded in year 2010, there are a total of 597 contractor companies which are qualified to undertake IBS projects. Of all the contractors, more than half are G7

contractors or big firms. Unlike the traditional method, the dominant of the developed construction industry is big companies. This is because production methods are allied to the technology applied (Manser, 1994). When growth in size changes the production techniques, a firm may benefit from technical economies of scale or mass production technically at a less cost. In old days, technical economies are less important in the construction industry as it is site-based which does not employ a large amount of fixed capital. However, when construction moves off-site and prefabrication technique is started to be used, the scope of technical economies of scale becomes greater. This is clearly illustrated when G7 contractors dominate the IBS market as they have better capability to invest in mass production with the updated and advanced technology.

According to Robert and Ernest (2002), the supply chain encompasses all organizations and activities associated with the flow and transformation of goods from the raw materials stage, to the end user as well as the associated information flows. Supply Chain Management (SCM) views the entire supply chain rather than just the next part or level, and aims to increase transparency and alignment of the supply chain's co-ordination and configuration, regardless of functional or corporate boundaries (Cooper and Ellram, 1993).

From the end of the 1980s, the construction industry has seen the launch of a number of SCM initiatives and main contractors have become increasingly reliant on other actors, e.g. suppliers and subcontractors in the construction supply chain (Ruben and Lauri, 2000). As noted by Cox and Townsend (1998), there is a relationship between improving SCM on construction projects and understanding the inherent behavior of firms in markets and the structural characteristics of those markets. Therefore, a myriad of construction supply chains need to be integrated by any construction firm when it delivers a solution to clients. The construction industry supply chain combines all relevant business owners such as clients, designers, consultants, suppliers of labour, plants and materials, and contractors. Each of these firms are having their own area of expertise, so they are undertaking different activities to make sure the construction project is completed within stipulated time, cost and quality.

On-site producing structure is counted as construction but factory-based prefabricated component is classified as manufacturing. Manser (2004) commented that construction firms are involved in relatively little non-construction activity and the industry is of little overlap into other industries, like the manufacturing industry. With the

application of IBS in the industry, construction is considered an assembly process where manufactured components are transported to site and erection work will begins.

The current construction industry supply chain is organized along the labour intensive lines with the bulk of work is undertaken in-site. It involves a combination of formwork preparation, ready mixed concrete usage and extensive sub-contracting. The IBS Supply Chain will transform the industry into a value chain similar to the manufacturing industry. By applying IBS, most of the on-site processes will be taken out from the construction site and put under a factory controlled environment where quality can be controlled and monitored.

5. MODELS ON COMPARISON BETWEEN TRADITIONAL AND IBS METHOD OF CONSTRUCTION FOR FRAME ELEMENT

The above discusses various literatures on the definition of construction industry, businesses or firms and the supply chain in the industry. For the purpose of the paper, a basic model of supply chain for both traditional construction method and IBS has been modified respectively from the literature and the frame element is selected as an example. These models as in shown in Figure 1 and 2 are illustrating the supply chain of frame element in traditional and IBS method of construction respectively.

Figure 1 and 2 shows major businesses involved in the traditional and IBS construction method for frame element. It is clearly shown that component manufacturers have actively participate in the IBS method of construction and they are producing different kinds of system depending on the requirements and designs. The manufacturers are classified as big player which have the capability in mass production with adequate financial and technological support in the industry. Anyway, trade contractors like the conventional carpenters, bar-benders and concreters who lay formwork, reinforcement and concreting are eliminated from the linkage. Then, material suppliers who supply material to the contractors for on-site construction are no longer needed in the IBS method. The manufacturers obtain directly the raw material needed from the respective provider. As shown in Figure 2, contractors who undertake the project will have to employ professionals like the consultants and project manager to monitor the assembling of products as IBS components require technical and specialized supervision as to achieve high quality. They must also engage with manufacturers and installer who had registered with CIDB.

Figure 1: Traditional Method of Construction for Frame Element

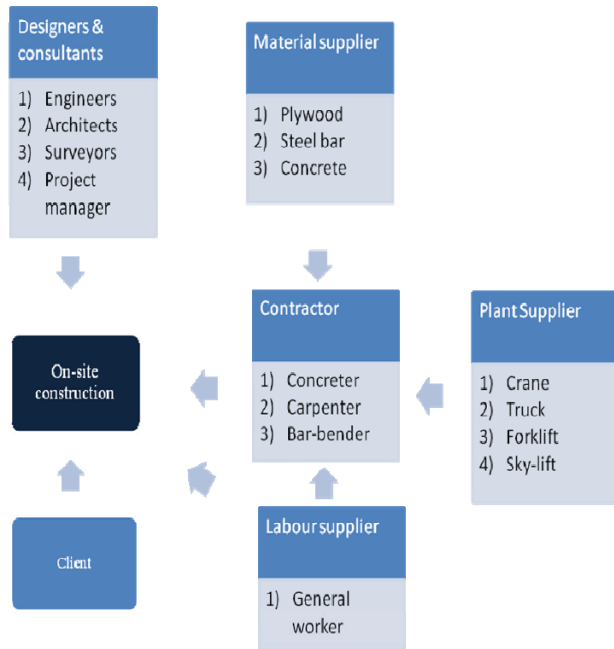
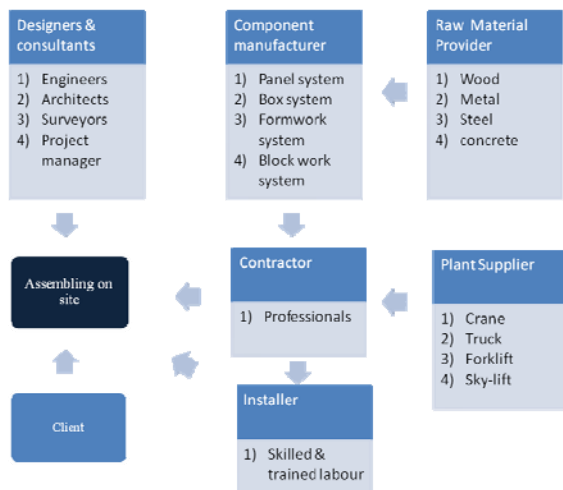


Figure 2: IBS Method of Construction for Frame Element



6. CONCLUSION

As part of the effort to enhance the efficiency, capacity and competitiveness of the Malaysian construction industry as well as to reduce the over reliance on foreign workers in the industry, the Malaysia government embarked on IBS in year 2003. Although it is a welcoming development, several quarters, such as small and medium trade contractors, component supplier are voicing their worries about the possibility of the demise of their trade and businesses. This worry has ground because all components are manufactured in factories and assembled on site by adopting IBS. The models show that when IBS is fully adopted, small trade contractors will be eliminated and replaced by large-scaled manufacturers.

REFERENCES

- Charles, T. M and Louis, F. S. (1995). *Making a Difference: Measuring the Impact of Information on Development*. Canada: The International Development Research Centre.
- Claudia, M. and Javier, S. (2002). *Business Creation and the Stock Market*
- CIDB. (2008). *Construction and IBS Industry – At a Glance (2008)*. *IBS Digest*, 01, 1
- Cooper, M.C., Ellram, L.M., (1993). Characteristics of supply chain management and the implications for purchasing and logistics strategy. *International Journal of Logistics Management*, 4 (2), 13-24
- Cox, A., and Townsend, M. (1998). *Strategic procurement in construction*. Thomas Telford, London.
- Danny, M. (2004). *Construction Economics: A New Approach*. USA and Canada: Spon Press
- Douglas Cumming and Dan Li (2009). *Public Policy and Business Creation in the United States*. Master. York University, Canada
- Hamid, Z., Kamar, K. A. M., Ghani, K., Rahim, A.H.A. (2008). Industrialized Building System (IBS) in Malaysia: The Current State and R&D Initiatives, *Malaysia Construction Research Journal*, Vol. 2 (1), 1-13.
- He´ bert, R. F. and A. N. Link (1989). In Search of the Meaning of Entrepreneurship. *Small Business Economics*. 1, 39-49
- Kamarul Anuar and Zuhairi, A. H. (2009). Industrialised building System (IBS): The Blue Ocean That is Green. *Proceeding at ICON BSE*, Malaysia: UTHM
- Lim, P. C. (2006). *Implementation Strategy for Industrialised Building System*. Master, University Teknologi Malaysia, Skudai.

- Manser, J. E. (1994). *Economics: A Foundation Course for the Built Environment*. New York: Taylors and Francis.
- Rajan, R. and Zingales, L. (1998). Financial Dependence and Growth. *American Economic Review*. 88, 559-586.
- Reynolds, Paul D. (2010). National Factors Affecting Business Creation: A Global Assessment. *ICSB Global Entrepreneurship Seminar*, 15 – 18 October
- Reynolds, Paul D. and Curtin, Richard T. (2008). Business Creation in the United State: Panel Study of Entrepreneurial Dynamics II Initial Assessment. *Foundations and Trends in Entrepreneurship*. 4, 3, 4-5. Boston: Now Publisher.
- Robert, B. H. and Ernest, L. N. (2002). *Supply Chain Redesign: Transforming Supply Chains into Integrated Value System*. United States: Financial Times Prentice Hall
- Rolf, S. and Sander, W. (2005). Determinants and Effects of New Business Creation Using Global Entrepreneurship Monitor Data. *Small Business Economics*. 24, 193 – 203
- Ruben, V. and Lauri, K. (2000). The four roles of supply chain management in construction. *European Journal of Purchasing & Supply Management*, 6, 169-178
- Timber Industry Should Move In Line with Use of Wood Construction (2009, May 26). *BERNAMA*.
- Yourse, F. B., Abdul Kadir, M. R., Hashim, A. H. (2002). Industrialised Building Systems Construction in Malaysia. *Journal of Architectural Engineering*. March 2002, 19 -23
- Zuhairi A.H., Kamarul Anuar M.K., Ahmad Hazim A.R., Maria Zura M.Z. and Khairolden G. (2009). *Industrialised Building System (IBS): Implementation Strategy from R&D Perspective*, CIDB Malaysia, University Technology MARA Malaysia and University of Salford.