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KNOWLEDGE INTO THE POLYTECHNIC ACADEMIC CURRICULUM

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**A CRITICAL INVESTIGATION ON THE INCORPORATION OF IBS
KNOWLEDGE INTO THE POLYTECHNIC ACADEMIC CURRICULUM**

ERITA MAZWIN BINTI MAZLAN

**A project report submitted in partial fulfillment of the requirements for the award
of the degree of Master of Science (Construction Management)**

**Faculty of Civil Engineering
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MAY 2009

“I declare that this project report entitled ‘**A Critical Investigation On The Incorporation of IBS Knowledge Into The Polytechnic Academic Curriculum**’ is the result of my own research except as cited in the references. The report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree”.

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Specially dedicated to my precious mother and father and both my parents in-law. And most of all I devote this, to my husband Nur Anbiah bin Abdul Aziz and my children Siti Aisyah, Siti Fatimah Az-Zahra, Siti Zulaikha and Abdul Rauf.

“For your everlasting love and care”

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“Dengan Nama Allah Yang Maha Pemurah
Lagi Maha Penyayang”

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شكر جزيلاً

ABSTRACT

The application of IBS in Malaysian construction industry is still locally as very low as well as very low if compared to the conventional methods. To be competitive globally, it is necessary for the local players to be efficient and equipped themselves with the relevant technology and experience. Therefore since 1998, CIDB has been actively promoting the use of IBS in the Malaysian Construction Industry. IBS Roadmap 2003-2010 was formulated to effectively coordinate the industry towards industrialisation; concentrating on the usage of IBS in the building industry. Under the construction manpower development programme, CIDB undertakes, among others to introduce IBS/MC syllabus to diploma and degree level students in private and Public Higher Learning Institutions. Currently, it is unclear how IBS knowledge is being incorporated into polytechnic academic curriculum. The view of this research is the uncertainty to be carried out with the aim to investigate the incorporation of IBS knowledge into the polytechnic academic curriculum. The research methodology covers questionnaire survey, interviews and document study. The findings of this research show that currently the polytechnic syllabus is not adequate to cover all aspects about IBS as outlined by CIDB. Polytechnic academic staff only focuses some elements of IBS in their lectures. In general the basic knowledge among polytechnic academic staff and polytechnic students are considered good because they can identify the benefits of the advantages of IBS.

ABSTRAK

Perlaksanaan Sistem Bangunan Berindustri (IBS) di Malaysia adalah di tahap yang rendah jika dibandingkan dengan kaedah konvensional. Untuk menuju ke arah yang lebih maju, sepatutnya pihak-pihak yang terlibat di dalam pembinaan perlulah memainkan peranan yang bersesuaian dengan teknologi terkini. Oleh sebab itu, pada tahun 1998, CIDB telah mengambil tindakan untuk mempromosikan penggunaan Sistem Bangunan Berindustri yang sememangnya membawa banyak kelebihan kepada Industri Pembinaan di Malaysia. IBS Roadmap 2003-2010 telah diperkenalkan dengan efektifnya khusus di dalam pelaksanaan Sistem Bangunan Berindustri ini. Bagi menjayakan usaha ini, CIDB telah mengambil alih di bawah program pembangunan pembinaan tenaga kerja, telah memperkenalkan IBS/MC silibus kepada pelajar-pelajar di peringkat diploma dan ijazah di peringkat pusat pengajian tinggi dan swasta. CIDB berharap dengan adanya pengetahuan teknikal yang baik di kalangan pelajar-pelajar tersebut dapatlah mereka melaksanakan Sistem Bangunan Berindustri dengan lebih baik di negara ini. Sebaliknya, apa yang berlaku di dalam pembinaan sekarang ialah mereka yang terlibat di dalam industri pembinaan masih lagi tidak jelas dengan pelaksanaan Sistem Bangunan Berindustri (IBS). Oleh itu, untuk tujuan penyelidikan ini, tiga objektif utama telah dibentuk iaitu untuk mengkaji IBS silibus di dalam struktur kurikulum politeknik, mengenalpasti secara umum tahap pengetahuan pensyarah dan pelajar di Politeknik Kota Melaka dan Politeknik Merlimau Melaka. Kajian kes telah dibahagikan kepada tiga iaitu berdasarkan kepada soal selidik, temuduga dan struktur kurikulum politeknik dan silibus CIDB. Analisa yang telah dibuat, didapati bahawa silibus politeknik masih tidak cukup untuk menerangkan penggunaan Sistem Bangunan Berindustri (IBS) ini berdasarkan kepada pensyarah politeknik hanya memfokuskan beberapa elemen IBS sahaja di dalam pengajarannya. Walaubagaimanapun, tahap pengetahuan mereka agak baik berdasarkan kepada analisa mereka telah mengetahui akan kebaikan penggunaan Sistem Bangunan Berindustri (IBS).

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LIST OF ABBREVIATIONS

CIDB	-	Construction Industry Development Board
CIMP	-	Construction Industry Master Plan
CIS	-	Construction Industry Standards
GDP	-	Gross Domestic Product
IBS	-	Industrialised Building Systems
KPKT	-	Minister of Housing & Local Government
MC	-	Modular Coordination
MP	-	Malaysian Plan
MS	-	Malaysian Standards
PKM	-	Politeknik Kota Melaka
PMM	-	Politeknik Merlimau Melaka
R&D	-	Research & Development

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CHAPTER 1

INTRODUCTION

1.1 Background

Over the past decade, the construction Industry has contributed significantly to the Malaysian economy. As Malaysian progressively marches towards industrialization, the role of the building is greatly enhanced, with the idea of transforming the aspiration and needs of people into reality. There is thus an urgent need to mass-produce quality housing that is affordable to all Malaysians. New and innovative approaches and technology are needed in the design and construction of houses to enable the nation to achieve this target Ministry of Housing and Local Government (1997). In Malaysian context, the government's policy on housing is that, the traditional building practices must be replaced by Industrialised Building System (IBS), which could save on labour, cost and time of construction and confers quality and durability (Elias, 2000).

Industrialised Building System (IBS) is a construction system that is built using pre-fabricated components. The manufacturing of the components is systematically

done using machine, formworks , and other forms of mechanical equipment. The components are manufactured off-site and once completed will be delivered to construction sites for assembly and erection. Junid (1986) expounded that an IBS in the construction industry includes the Industrialised process by which components of a building are conceived, planned, fabricated, transported, and erected on site.

According to Badir et al.(1998) building system can be classified with four main categories :

- 1) conventional building system
- 2) cast-in-situ formwork system – table or tunnel formwork
- 3) prefabricated system and
- 4) composite system as shown in Figure 1

The last three building systems are termed as IBS.

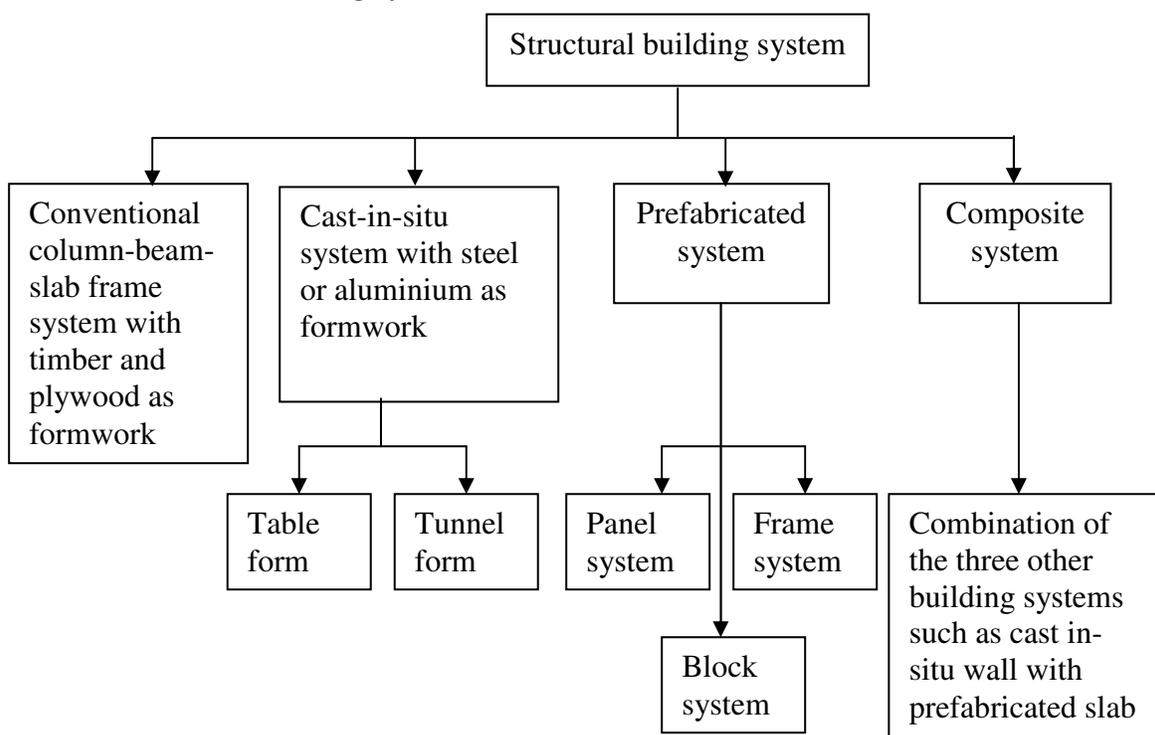


Figure 1.1: Shows the Building System Classification.

Source : Badir et al.(1998)

The IBS as mentioned above are not new in Malaysia. For example, precast wall system has been adopted in Malaysia as early in the late 60s. The government (Ministry of Housing and Local Government) in 1964 identified two pilot projects in order to try out the industrialised prefabricated system. The first of these projects was in KL. 22.7 acres of land along Jalan Tun Razak (Jalan Pekeliling) was acquired for the construction of 7 blocks of 17-storey flats, and 4 blocks of 4-storey flats comprising about 3000 units of low costs flats and 40 shop lots. The second pilot project was in Pulau Pinang with the construction of 6 blocks of 17-storey flats and 3 blocks of 18 storey flats comprising 3,699 units and 66 shop lots along Jalan Rifle Range (Harun Din, 1984).

Precast concrete technology offers tremendous benefits in achieving easier and quicker erection of the building structure (Low, 1999). Warszawski (1999) mentioned that the benefits of IBS when applied to a building process include savings in manual labour on site (up to 40-50 percent of the input in conventional construction), especially in skilled trades such as formwork, masonry, plastering, painting, carpentry, tiling, and pipe-lying (electric and water supply). Careful planning of precast work can improve productivity, speed, and total cost Ismail (2001). Building constructed by this method have a short construction time and standard quality (Senturer, 2001).

Even though the IBS has been in existence for a long time but there are still many unresolved issues. Some of the issues are the ability of the industry players to equip with necessary technical knowledge in order to adopt IBS in their projects. Examples of this lacking are clearly reflected in the quality of the completed projects and there are situations where IBS could not be continued due to unavailability of relevant technical experts (Ahmad Baharuddin et al. 2006).

1.2 Problem Statement

Knowledge in construction technology is known to be important. There are cases, where IBS building projects were carried out with many difficulties (Ahmad Baharuddin et al, 2006). In promoting the usage of IBS and towards achieving better productivity, safety, and quality of construction, CIDB Malaysia has formulated a master plan to facilitate the transformation of Malaysian Construction sector. According to Elias Ismail (2008), one of the most important in the IBS Roadmap 2003-2010 which had been endorsed by the Cabinet of Minister in 2003 is to introduce IBS/MC syllabus for diploma and degree level for students in the public and private higher learning institutes. This is based on the government aspiration to produce IBS/MC to the graduates that may generate the modernization of Malaysian construction industry in future.

As for polytechnics, IBS syllabus is introduced to the first semester certificate of civil engineering students. Most of the students are exposed to IBS syllabus in one of the core subject namely concrete technology. Students have been taught basic knowledge on the IBS system such as precast concrete and prefabricated technology in term of manufacturing method, transportation, installation at the site, advantages and disadvantages, and the problems arise in the prefabrication technology. Unfortunately not all IBS syllabus as outlined by CIDB has been implemented in polytechnics academic curriculum. According to the Manager of Construction Technology, and Innovation Development Division, the IBS syllabus that have been regulated by CIDB should be properly implemented in polytechnic.

This is considered an up hill task as the level of understanding towards IBS among polytechnic lecturers. This is because they are accordingly bounded to the syllabus fixed by the curriculum department of Ministry of Higher Education Malaysia. Mustapha Mohamed (2007) said for the objective to be within reach, universities/polytechnics should organize by giving the necessary coverage to their lecturers concerning the suitable curriculum to be adopted that include future needs of the industries.

The subject of precast concrete in polytechnic has not been synchronized with IBS syllabus. As a result students are not familiar with IBS. According to Ahmad Baharudin et al.(2006), Engineers with good technical knowledge in analysis, design, manufacturing, and construction have the ability to produce systematic IBS system. Lack of knowledge in structural analysis and design of prefabricated components among civil engineers and those related to construction discourages further the implementation of IBS.

Thus, research is needed to identify the current syllabus on IBS content in polytechnic and examine the level of understanding towards IBS among academic staff and students.

1.3 Aim and Objectives of the Research

The aim for this research is to critically investigate the incorporation of IBS knowledge into the polytechnic academic curriculum. In order to achieve the aim, the objectives that have been set are:

- a) To study the current syllabus on IBS in polytechnic academic curriculum
- b) To identify the general knowledge of polytechnic academic staff towards IBS.
- c) To identify the general knowledge of polytechnic student towards IBS.

1.4 Scope of the Study

The limitation of this research is focusing on the first, second and fourth semester students pursuing certificate in civil engineering and lecturers from Politeknik Kota Melaka and Politeknik Merlimau Melaka.

