

OPEN BUILDING SYSTEM TOWARDS FUNCTIONAL SUSTAINABILITY FOR
AN AFFORDABLE HOUSING IN MALAYSIA

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To beloved family and friends,
Thanks a lot for all your endless supports and encouragement.

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ABSTRACT

Open Building System (OBS) is the new concept which being introduce to create more affordable housing to fulfill the market demand. OBS as a component of Industrialised building system (IBS) could be considered as a economic and easy construction method which the system help up the construction speed at the same time. Although Malaysia government put effort on it but it seems the effect of IBS still do not give big influence in Malaysia housing industry. Through introducing OBS as component, the erection process of IBS building could be flexible and less time consuming. In previous erection process, most of the construction method are using hybrid construction method which combine the conventional and IBS method. In the study, OBS uses full IBS component to erect the house. Besides, the respond and demand of public are taken into account when implementing the OBS into Malaysia housing industry. In order to provide affordable to Malaysia housing due the inflation of the material, new methods of construction such as OBS need to be introduced in order to ensure the housing in reasonable category and affordable by the Low income group in Malaysia. The research found out that, Malay house is a good example to be study and to be re-implement in the industrialised building system. The basic concept of Malay house is it start with a 'Rumah Ibu' or Main House which consist a kitchen, living and a bedroom and can be expanded later as needed. In research also found out that, Malaysian are not satisfy with the housing industry in the country, in term of quality and the selling price of the house. In introducing the OBS into housing industry, the construction cost and period of erection could be reduce by 50%. Besides, renovating house which becoming a culture among the Malaysian can be realised. The implementation of new ideas of construction industry such as OBS is important in enhancing the construction industry in Malaysia.

ABSTRAK

Open Building System (OBS) merupakan satu konsep baru diperkenalkan untuk membina lebih banyak rumah mampu milik untuk memenuhi permintaan pasaran. OBS merupakan satu komponen kepada Industrialised Building System (IBS) dimana ia dapat dianggap sebagai salah satu cara pembinaan yang ekonomi dan proses pembinaan yang senang serta mempercepatkan proses pembinaan. Walaupun kerajaan Malaysia telah berusaha memperkenalkan sistem pembinaan IBS tetapi pulangnya tidak memberangsangkan kepada industri perumahan di Malaysia. Dengan memperkenalkan OBS sebagai komponen, proses pembinaan rumah IBS boleh menjadi lebih fleksibel dan berkos rendah. Dalam pembinaan sebelum ini, cara pembinaan hybrid banyak digunakan dimana ia melibatkan cantuman cara pembinaan konvensional dan IBS. Dalam penyelidikan ini, OBS akan menggunakan komponen IBS secara keseluruhan untuk membina bangunan. Di samping itu, keperluan dan permintaan bagi masyarakat juga diambil kira dalam mengimplimentasikan OBS ke dalam industri perumahan Malaysia. Dengan membekalkan rumah mampu milik bagi mengatasi masalah inflasi, cara pembinaan baru seperti OBS harus diperkenalkan untuk memastikan rumah dijual pada harga yang mampu dimiliki oleh golongan berpendapatan rendah di Malaysia. Penyelidikan ini mendapati Rumah Melayu merupakan satu contoh yang boleh dilibatkan dalam pembangunan and penyelidikan system IBS dan OBS dimana konsep pembinaan Rumah Melayu bermula dari rumah ibu, dan rumah asas akan berkembang mengikut keperluan tuan rumah. Penyelidikan ini menunjukkan rakyat Malaysia belum berpuas hati dengan situasi industri perumahan di negara ini bukan sahaja dari segi kualiti bahkan harga jualan rumah. Perkenalan OBS dalam industri perumahan dapat menjimat sebanyak 50%. Pengubahsuaian rumah telah menjadi satu budaya di kalangan rakyat dan dapat direalisasikan. Penerokaan baru seperti OBS diperlukan untuk menambah baik industri perumahan di Malaysia.

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CHAPTER 1

INTRODUCTION

1.1 Background

Industrialize building system (IBS) is providing the basic living needs to the human which they could construct their house within their budget and flexibility. Industrialize building system could be considered as a economic and easy constructed method which the system could help up the construction speed at the same time. Although it is old topic to discover but it is a long way to go to achieve the satisfaction. Throughout the research topic, it will be discuss based on architecture and engineering perspective in order to achieve basic comfort and secure for the users.

Industrialize building system is a system where the space planning gives the flexibility to purchaser or owner to choose and plan the size of their house due to their budget. The system could allowed the building to be expand and contract due the purchaser needs. But the expansion and contraction for building still a headache for the construction industry, because the flexibility might not be as what being imagine today. Industrialize Building System only being stress and implement in

Malaysian for this few decades. Some others country IBS also being known as prefabrication building or precast building.

Most of the researcher are looking at the detail part of the system, which are the stiffness of building structure, material use for the prefabrication system, the sustainability of the building. At the end the building being break to into small parcel or component and the houses or building did not being treat as a whole which cause lot of aspects which missed to be consider.

Today, majority of the developer and purchaser always have a mindset that industrialised building system need to produced in large scale for cost saving. The main reason for this mindset is generating the system in a small scale is more expensive than the normal construction method. As a look backward to the history, Malaysia have a very good example for IBS discovery rather than keep on developing the concept that may leads to failure.

Malay house is a good example to be study and to be re-implement in the industrialised building system. The basic concept of Malay house is it start with a 'Rumah ibu' or Main House which consist a living and a room, and it only expand to Rumah Dapur Kitchen and so on. When the house grow older it will expand and more rooms or spaces to be added in due to the needs of the house owner.

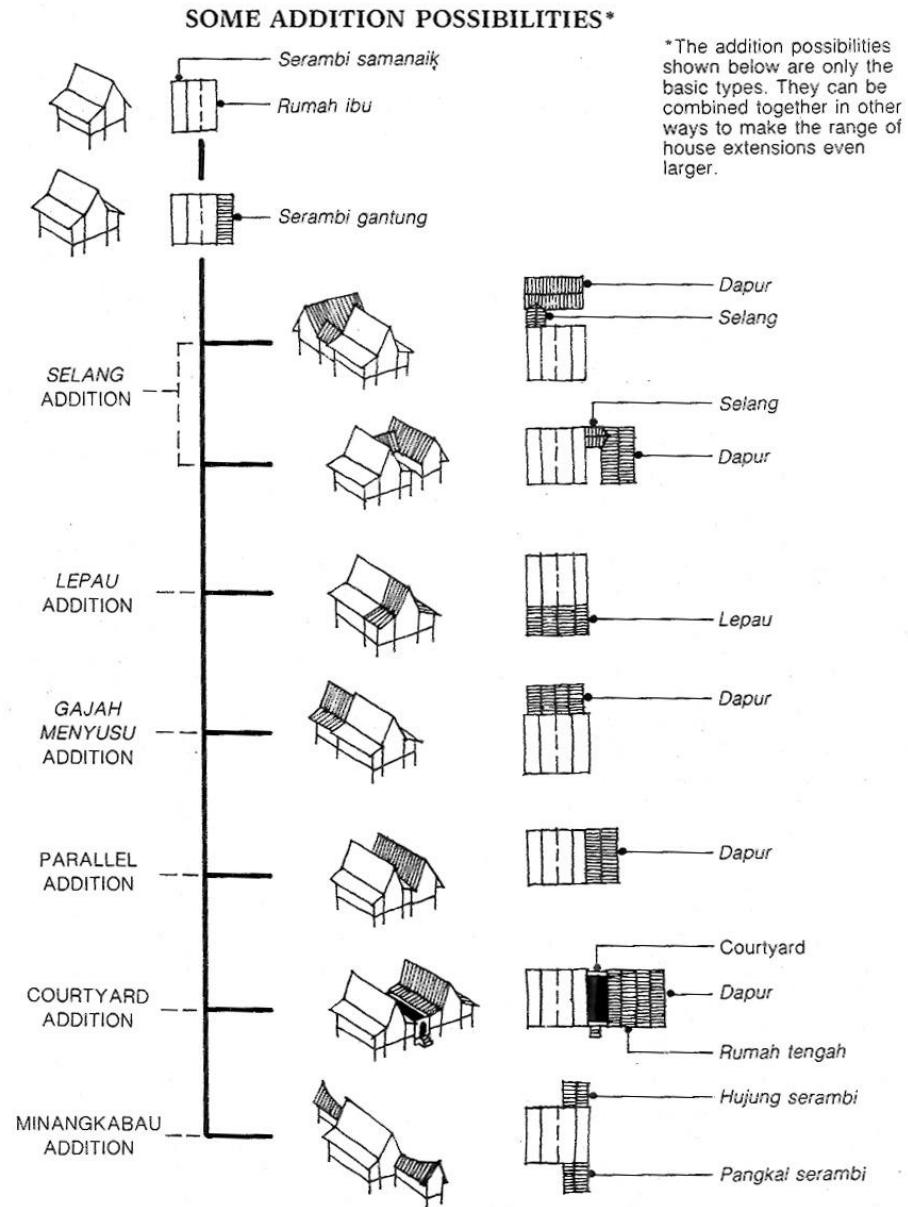


Figure 1.1: Common addition sequence for a Malay house.

When the study of Terengganu Malay house, the house being design and build to be mobilize and can be moved from a place to another place wherever and whenever the owner want to move the house. The house can be moved just by some man powers. this means the building is a lightweight construction. The Malay house construction system used 'Tanggam' system(joint system) to construct. The construction method could be assemble and disassemble easily. Throughout many good examples for the history, a lesson need to learn and injected into IBS in Malaysia. There some example that could be refer besides Malaysia Malay house

such as Jewish house, an Egyptian house, which having a similar concept to the Malay house as mentioned above, but the culture should be embedded in the design. stage of IBS

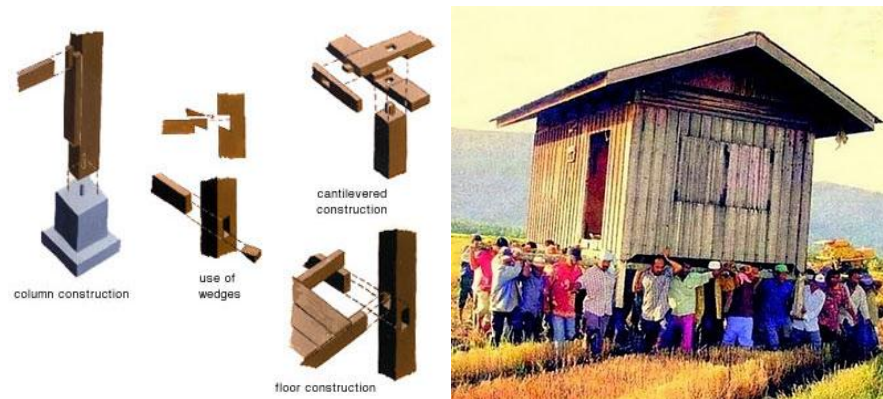


Figure 1.2: Construction of Malay house and moveable Malay house.

1.2 Problem Statement

Housing is one of the large scope that can be research and develop through the implementation of industrialised building system. Since 1966, Malaysia government have a clear indication that they are concern about housing in the country. The housing development act have been gazette and implement in Malaysia Building by Law.

Malaysia could be consider as in rapid developing country but the existing housing act is having a minimum control towards the developer in Malaysia. Somehow, more housing being build but becoming more expensive commodities. The research in Johor Bahru housing market shows that, a normal house could go beyond RM 800,000.00 for a double storey terrace house with cheapest it is around

RM 400,000.00. This figure shows that, the pricing properties of Malaysia has over shoot beyond the affordable price by consumer.

There are a lot of effort being put by Malaysia government , such as low cost housing scheme and 1 Malaysia housing scheme to help up Malaysians, that could afford a house. The results still yet to reach a satisfaction levels. The joint venture program between the government and private developer, with the government at the losing sides where the private developer always is think to give the minimum and gain the maximum at a uncontrollable situation. Although the price of the housing has been set at minimum, but the quality of the house is still could not be ensure to the buyers. Besides, the designs for low cost housing always to be a multi-storey flat in which its design always bring up to social problem issues to the community.

Furthermore, the environment that has been created through the affordable housing is yet to reach a user comfort and functional level, where most people do not prefer to own it. The comfort level such as high heat absorption and high carbon foot print has been ignored. Aside from that, the low cost housing design always not giving back the culture to the purchaser and the community in neither, Malays, Chinese nor Indians culture. In comparison to HDB being develop by Singapore government, Malaysia low cost housing is left much far behind and there is a lots of opportunity for improvement could done to cheer up the Malaysia community.

Although Industrialized Building System (IBS) has been introduced by government since 1960's, but it still not a ideal system by the developer on as a construction methodology. The costing for precast construction ha been marked as being much expensive in comparison to ordinary construction method. Contractors who use the industrialised system fear to be eliminated from the market and deciding that the installation of the building component need a skill expensive worker and machine to install it. Besides, IBS system being introduced do not have a complete component for conducting a rapid construction. A mixed construction system still may be applied. Malaysia IBS development has still have a big opportunity to give a big hand to affordable housing development.

1.3 Objectives

The main objective of the research is to improve and achieve a functional and sustainable for affordable housing in Malaysia it is for a low income group by injecting comfort and safety value into the housing. The related objectives.

- i) To assess the modularization of housing plan to fulfil the functional value.
- ii) To study the construction lifecycle to reduce the renovation or alteration cost.
- iii) To analyze cases of modularization for codes of practices of loads.

1.4 Scope and Case Study of Research

The case study took the previous research as reference. The scope of research as a reference with the scope of research as listed below.

- i) The component used for the industrialize building system housing design is using proposed component by UTM research.
- ii) Study the effect of alteration of building by adding the spaces vertically or horizontally.

1.5 Significant of Study

The research give a overview of the industrialised building system in Malaysian that could give future researcher a direction of what the Malaysians need for affordable housing. This research are combining the IBS component as a building and view it at a wider perspective of living rather than focus on the components of the building. It is a new mile stone of IBS in Malaysia for IBS house owner to expand and renovate as easy and convenient as their needs. This research is to bless all Malaysians to achieve the target that every Malaysians may afford to have a house of their dream.

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