



# Evaluating the Design and Construction Flexibility of Traditional Malay House

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**Abstract** □ The ubiquitous terrace house is undeniably the most popular and affordable housing type in Malaysia. It has long been considered as one of the densest forms of property development and has become the common typology of accommodating the masses for this country. However, in Malaysia (like other third world countries), the design of a house has never grow from novelistic idea of style and revivalism. As stated by Tajuddin Rasdi (2003), housing in Malaysia has been plague with various issues for decades. We are currently living separate and individual lives in the sea of congested modern housing and we will be forever plagued by the mercy of crime, climate, cultural tensions and threats from accidents. For the last 50 years it has never grown to create the idea of community and fulfill the true need of a family with its culture and context called ‘Malaysia’. Based on our paper N. Utaberta (2009) ‘Growing House: Lesson from Mathematical flexibility of Traditional Malay House’, there at least six (6) problems in Modern Malaysia housing which are; safety especially in the high rise and terrace housing, criminal issue in the housing complexes, problem of privacy and cultural tension, thermal comfort and its ability to grow based on the need of the owners and community while from the family perspective there are at least four (4) main problem of our current modern housing which are the need of one family to grow or reduced based on the grow of the family members, cultural gap between old people with the youngster, the increase of family members as a result of marriage and family bond and the need of one family to move from one place to another. We have identified the ability of traditional Malay house to grow and transform based on the need and interest of one family. This paper tries to study and evaluate the flexibility of a low rise house in Malaysia. It will explore some design and construction framework based on the flexibility of our traditional (timber) Malay house and some modernist idea of growing and transformable house.

**Keywords**— Design and Construction Flexibility, Growing House, Traditional Malay House

## I. INTRODUCTION

The main purpose of this paper is to identify major problems that occur from the restriction in growing and transformable of modern housing in Malaysia. This process of identifying is very important for a need of a family as a basic element from a civilization to grow or being transformed into one different form of family. The need of the development and transformation of a family were identified and filled by the traditional craftsman in Malaya since a long time ago throughout their architecture approach and its proofed to be adapted and sensitive to the culture needs and the local spirit

from a family. The structure itself will be divided into 5 part; Crisis and Problems in Architectural Study, crisis and problems in Modern Houses, Crisis and Problems for Modern Houses to Expand from a Family Perspective,

Lesson from Malay Traditional Houses, Lesson from A few Master Architect of Modern Architecture and last but not least; Issue and Factor That Influence the Consideration of the Expand House Design. It is expected that this paper will be inaugurating more in-depth study on this Malay cultural heritage which getting forgotten by architects as modern craftsman which looks so zealous and referring to

foreign architecture art product that might be less suitable even against Malaysian culture and societal needs.

## 1. Problem of an Approaches in Architecture Study

Major problems that arise from various study in architecture latterly is the tendency of object oriented. Architects and academician in this fields' would prefer to see architecture as a science to generate building and mould an appearance style only. Profession and architecture knowledge also treated as a work of art and developed as an elite knowledge and only involve a few people such as John Ruskin said:

*"The architect is carefully guarded from the common troubles of the common man, building ignorant, and purse proud digesting machines...Living art must have more in it than imitated Style".<sup>1</sup>*

Attitude with object oriented would set aside value and context framework from architecture product. Architects and academician often neglect the society social problems, culture, even comfort to achieve the glorious style or metaphor oriented design. Space or building as an art of architecture often being displayed as a symbol of expression and a style without considering the human who stay inside the building.

Attitude and perspective that seeing architecture as an art and style made it secluded from real needs from the user and become an elite study that only can be understood by some people and particular group. This kind point of perspective intend to see architecture more as a product with a sense and imagination that very hard to measure and abstract. Architect should learn from planning experience of Crystal Palace building and Eiffel Tower where's the result of hard work, rationalist thinking and empirical from engineer has succeed in producing an extraordinary architecture that become very well acknowledged even until today.

Architect and academician in architecture should overcome their safe zone blending with others professional and academician such as anthropologist, engineer, psychology, doctor and mathematician in collaborating expand this field especially in order to preserve and meet the life, culture needs and values of current Malaysian society.

As mentioned before, architecture crisis and problem also contributed lots by architecture education and profession attitude. Elite building has become most of the studio design project such as an artist house or vacation place, rarely we found studio design project which touches the community such as housing and public space which sharpen the

sensitivity of the student to understand the social problems and contribute to their society in return.

## 2. Modern Housing Problems to Grow From the Family Point of View

One of the clear example showing the architecture problems as stated above is the existing condition of modern housing planning nowadays. Various modern housing such as terrace house, cheap housing, cheap apartment to the luxurious apartment and bungalow facing various serious problems in term of safety, security, comfort or culture suitability with the existing culture in Malaysia.

There are at least six main problems in current modern housing in Malaysia; safety problem especially for high rise building and terrace house, crime problem in housing estate, privacy, Inter-culture interaction, thermal comfort and its ability in expanding according to the need from a house problem. This paper specifically will debate about the last problem which is the ability to expand of a modern housing in meeting the requirements and culture of the owner. Without reducing the importance of others problem above, is the ability to expand of a modern housing is very important especially in an effort to strengthen up family institution as smallest unit in Malay civilization. Therefore, an analysis and discussion are needed from the family view in order to identify the problem and interest from this very own research.

Based on our observation, there are at least four (4) main problems in present modern housing viewed from the family perspective. First problem was the fact that a family will grow and reduces in keeping the development of its family member, second problem is the change and difference cultural between old generations and the young, third problem is family member expansion through family marriage and relationship while the last problem is a possibility for a family to move from one place to another place.

First problem is a problem which will and doubtless happened to all family. In every family, child will definitely grow and old people will be getting older. In each children life phase of growing, absolutely they need different approach and space needs. Children below than 5 years old need of space certainly different with the schooled child which will be totally different with the teenagers and college/university student. Modern housing latterly is less sensitive on this requirement. For the unschooled child and schooling child they must be doing a lot of outside activities rather than the youth. So, they need luxurious external space outside the house but along with their development at the same time, probably they need luxurious room space by the time entering youthful age. Because of the existing modern house does not have any mathematical elasticity or flexibility, it's very difficult for the owner to fulfill the needs of their child expansion demand of comfort life.

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<sup>1</sup> John Ruskin, *The Seven Lamps of Architecture*, (London: George Allen & Unwind Limited, 1925). P. 48

Others model example comes from the age increase of the Gold Citizen or Old Citizen. At the age 30 or 40 year they could be healthy enough to climb up the staircase heading towards their room on top floor. However, entering an age of 50 or 60, their physical condition is not allowing their body to climb up the staircases. Therefore, a house need to adaptable and adjustable according to this need. The increasing of family members such as newborn baby need to be considered in order to expand a house because a reserve space are needed to support the new family members.

Second serious problem is changeable and cultural difference between old and young generation. In planning a space so called a house, an architect need to be sensitive on the privacy and self expression of young generation especially the youth. Other perspective viewed, an old citizen as a matured generation. Throughout all their experiences, this generation are rich with knowledge and lesson. They also need a place to deliver their experiences and lessons as well. Therefore, space planning for both generation need a special treatment. Without any smart solution both generation will face a very huge potential conflict as we can easily seen in our modern housing nowadays.

There is the third's problem to be considered in term of expansion of a house; increasingly of family members throughout marriage and adoption. These two ways of increasing one family member will bring the outsider to be part in the house as well. Every family has their own method in treating their family member. It required a specific approach and different treatment to outsider which finally produce the need of specific space and grow.

Last but not least; the last problem is a possibility for a family to move from one place to another place. Those needs are very important in a family for not being static and passively at one place forever. Many factor influenced a migration family, whether workplace transfer factor, natural disaster, children ' school planning or opportunity to increase family economic status. A fact that a family had to move out need a solution and attention which eventually give some implication on the planning of a house. House should be flexible to easily manage, redecorating, and transferrable in order to fulfill the needs. Which mean the house must be movable, portable, easily retransform, and grow based on the need above which need to be considered.

### 3. Lessons from Traditional Malay House

In traditional Malay house architecture, the usage of mathematical basic principle is common and not new instead. Human body such as foot and head has been used as a basic concept in term of balancing a house design which represent as pillar or column, wall, floor and roof. There are various measure systems to build up Malay house such as fathom, cubit, span, finger and knock. That measurement usage is different between each house and it is referring to

'rumah ibu' measurement; a woman being a wife and mother to the children of the house. Tray usage is closely related with the space function as celebration space. By using tray as basic measurement system, number of guests could be loaded into that space can be organized during construction of a house. Apart from tray, also found Malay house which use 'Nipah' roof as basic measurement system. 'Nipah' roof production is uniform (about 5 foot) and the usage of those materials as basic measurement system could avoid cutting during the construction.

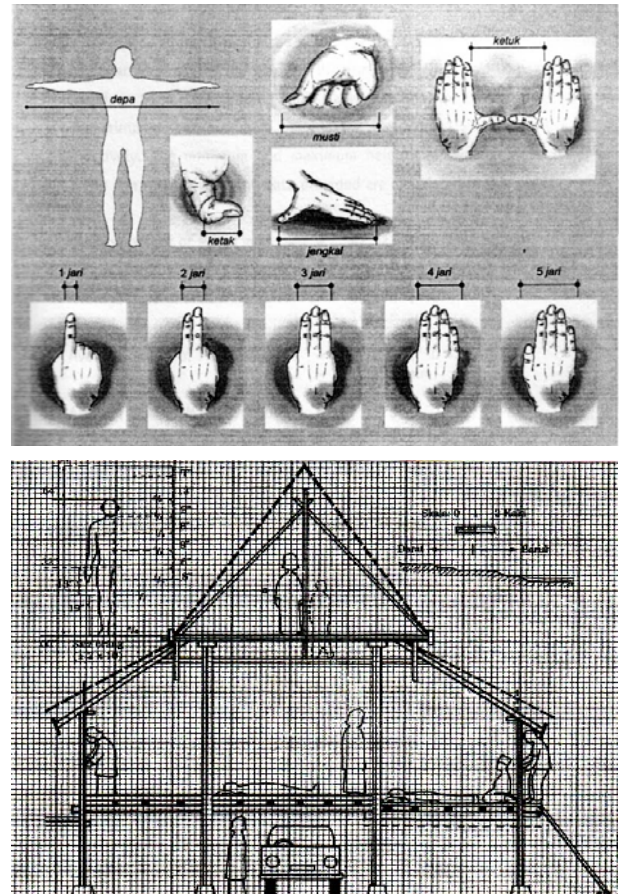


Fig 1. The Design of Malay House was base on balancing of concept human body.  
**Source:** Centre for Study in Built Environment in the Malay world (KALAM), University Technology Malaysia.

Design and Malay house construction also based on organic concept which enables it changed whether in size form or the location. In terms of size, the increasing of economical stage is lead to largest and gorgeous house instead. A large Malay house construction such as 12 columns and 16 columns could be constructed gradually because of module basis design. Hence, in construction process, the original house will be remained and will be connected with the other new unit using 'selang'. Malay house flexibility is not limited on expanding the house but it also works to reduce the sapce according to the needs. For example, head of a family decade ago will give part of the house to their son as gift for their new marriage. Therefore,

the unit gave by the head will be lifted up and move to a new site by the vilagers around.

Instead of lifting up, Malay house also can be transferred by separating the component one by one. Malay house construction system which uses wood construction material and joined using peg and joint, enable it to be opened and fitted back without damaging the original design. As a conclusion, the sensitivity to the balance aspect in Malay traditional society, practicality, and flexibility has motivated themselves in created a simple mathematical theory in design and construction of the Malay traditional house.

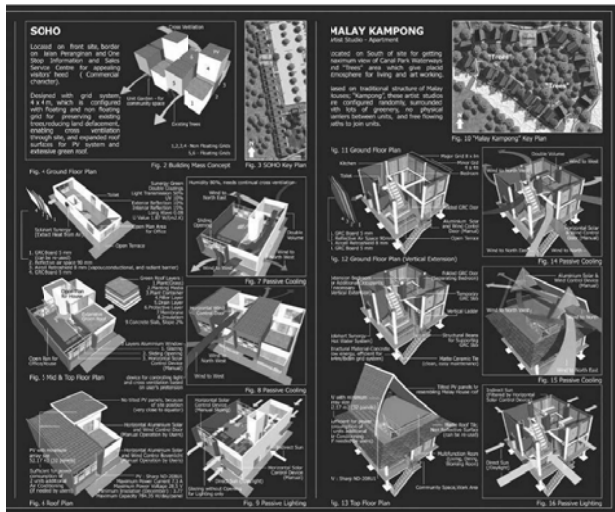


Figure 2: One sample of growing and transformable traditional house implementation to the design of small office house (SOHO).  
**Source:** Willy Rahadian Pranata, Professional Master Awards Malaysia Winners, Futurarc Prizes 2008: International Design Competition for Green Architecture.



Figure 3. Traditional Malay house was move from its old site to the new site,  
**Source:** Abdul Halim Nasir 1985

#### 4. Some Ideas from Modern Architecture

Apart from lesson from traditional Malay house mentioned above, this paper also identify the lesson that can be consider from Modern Architecture effort to enrich more idea and approach in handling the need of this expanded house. There

is three idea and approach from Modern Architecture master that has been calculated to enrich our idea and approach on this very own expanded house topic; Le Corbusier modular system, Frank Lloyd Wright site idea adaptation and open plan idea by Mies van der Rohe. Hoped this additional study can enrich, complement or become comparator media to various idea and lesson from traditional house mentioned previously.

#### 4.1 Modular system by Le Corbusier

One of master architect in Modern Architecture, Le Corbusier have adduced an important idea and suitable for this paper. Le Corbusier present an idea on planning and dividing a building elements based on a system and certain standard or module which can be produced as mass production in the factories. The main purpose from this division was to achieve a standard and esthetical proportion in order to produce a building with an aesthetical value and beautiful building ratio and arrangement such as in the past. With an understanding on customer and accurate standard, this approach very useful for an expansion house. Building element division into smaller standard will be accelerated manufacturing process, facilitate him to develop and removes from one place to another place.



Figure 4. Sketch of study on modular ratio by Le Corbusier,  
**Source:** Le Corbusier, 1925

#### 4.2 Open Space Idea by Mies Van Der Rohe

Idea and other approach which might useful for idea on this expanded house idea is an idea of open space or open plan that has tried to be proposed by Mies van der Rohe. Through the idea on freedom and flexibility structure, he try to oust and to loss the functional of structure from wall in a building to post or structure. By moving or losing the wall function as a structure in a building, space in a determined building would be simple arranged and renovate by existence wall (see picture 4). For common knowledge, this opens space idea is not a new idea. Japanese society through paper and ratio house 'tatami' has molded and use this open space concept in their houses which still relevant and apply until today. However only Mies is the architect who successfully expand this open space idea with enough. Support from the structure technology and framework aspects. Another contribution from Mies Van Der Rohe in architecture that usable for this very own expanded house

idea is the idea about the grid system which divided all design aspect into small element and component. Such as modular system, the small grid element will possible a wide expansions to all direction with and observation on aesthetic aspect and the effectiveness.

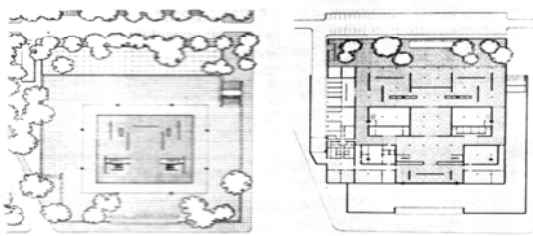
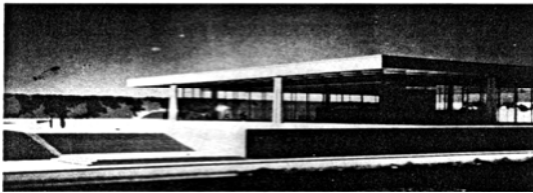


Figure 4. Building by Mies van der Rohe which shows the universal use of spaces inside the building,

Source: Curtis, William JR, 1982

### 4.3 Site Adaptation by Frank Lloyd Wright

Another approach that can be considered as a lesson in this expanded house is what Frank Lloyd Wright tried to carry out. In various 'Prairie' house, Wright are not producing any standard like those done by Le Corbusier or Mies Van de Rohe. He individually work on his design totally and seriously strive to give the best space in order to fulfill the customer's need and at the same time cater to his idealism as a naturalist and American democrat as he stated below;

*"The real body of our universe is spiritualities-the real body of the real life we live. From the waist up we're spiritual at least. Our true humanity begins from the belt up, doesn't it? Therein comes the difference between the animal and the man. Man is chiefly animal until he makes something of himself in the life of the spirit so that he becomes spiritually inspired-spiritually aware. Until then he is not creative. He can't be."*<sup>2</sup>

Contrasts with Le Corbusier and Mies as mentioned above Frank Lloyd Wright see the site as a largest element which determines direction from a design beside demand and need from the customer. Building or space he design specifically and specific suitable and planned only for particular location only. Building cannot be placed anywhere. In this site planning approaches, Wright is very careful in taking care of the environment around by inserting

his building into the existing nature arrangement on site. By doing this, space or building will be united with the environment and will be interacted positively. Building material selection, ornamentation, and design method also are very well standardize selected using the technology and local material and lead to low cost maintenance and easily modified in the lifetime. This principle and approach will be so useful and important for house planning which expanded in future. Although seen based on the system and method such as done by Le Corbusier and Mies Van De Rohe, however Wright approach is very important in order to optimize and ensure the compatibility between space and building as the context where it's staying.



Figure 5. Some Frank Lloyd Wright's building which integrate the natural surrounding with its building's spaces,

Source: Wright, Olgivanna Lloyd, Frank Lloyd Wright.

## 5. Design Frameworks, Issue and Influenced Factor for the Design of Transformable and Growing House

As a product from Malay traditional house and Modern Architecture lesson as mentioned previously, a few principles and design framework would have to be considered in expansion design houses framework. Those frameworks and issue are material selection, elasticity of the space and space shape selection, structural extension system study or jointing and study on social condition and Malay and sensitivity society ' culture on site and context. Hoped this short discussion could provide early framework and start a deeper study that contribute on the better design expansion in the future

### 5.1 Material selection

<sup>2</sup> Wright, Frank Lloyd, Truth Against the World, issue 270

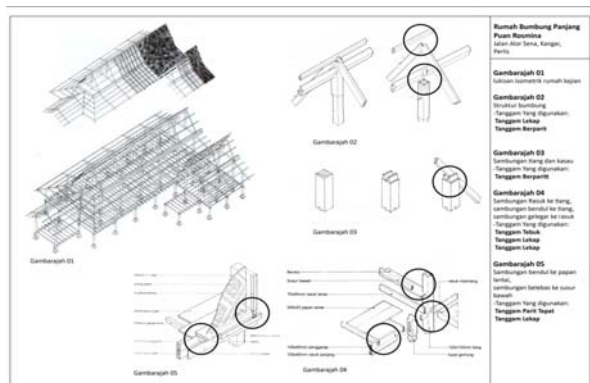
Material selection was most important element in growing and transformable house application. Material selection is one of very crucial element because through the material selection, growing and transformable house flexibility can be decided. Material selection of brick and masonry seemed to be less appropriate for housing in Malaysia as it's not very well blended with the weather and climatic conditions of this region. This material even complicates the process to change a form or grow of a house. Wood was most suitable material choice and potential to be used in Malaysia house. With an accurate and detailed study, various weaknesses on wood such as strength aspects, ability to sustain on weather and shape selection and specification, wood will become a very important material choice and useful for this expanded house concept.

## 5.2 Elasticity of space and shape selection

Other factor and framework, elasticity from the space and space shape selection also need to be considered in expansion framework and proposition of expanded houses design. Mies Van De Rohe has done a open space concept and grid shape selection and could be a accurate reference in choosing a flexible space and more congenial form.

## 5.3 Extension or joint structure system

The other factor that needs to be considered for a growing house is understanding and accurate study on joint system and construction system. Joint system is one of the key components in order to enable a house to be developed and the element could be jointed and rearranged. With a detail study and deeply into the joint system or in Malay traditional house so called as 'tanggap', a growing process and rearrange of a house could be made accurate and efficiently in term of strengthens or financing.



**Figure 5.** Some Detail study on traditional 'tanggap' system of traditional Malay House,

**Source:** Centre for Study in Built Environment in the Malay world (KALAM), University Technology Malaysia.

## 5.4 Deep study on social condition and society culture

Issue and main frame that does not trifling for expansion a house is a deep study on social condition and culture from

society which would use and staying in the house. With a deep study, description on social culture and condition from a society, we will identify daily pattern, need and character from family unit from society live at the house. Understanding on daily pattern, this social need and condition would be administering us enough ingredients for planning of space in a house together with daily rhythm and the possibility of expansion.

## 1.5.5 Sensitivity on site and context

Last but not least, very important factor is sensitivity on site and context. Principally, this last issue akin previous issue and factor, however if previous factor more see on aspects not physical, so this last factor is more focus on physical aspect from the site environment itself. Method and approach used by Frank Lloyd Wright as mentioned previously, carefully putting a mass building and chose material and construction method has to be considered and exemplified in a expansion house in order to achieve a positive interaction with surrounding site.

## II. CONCLUSIONS

From description above, standing out that traditional Malay house has own potential and ability to develop nicely with still defend the sensitivity and good relationship with surrounding community, from culture social aspect or the pragmatic need. With a perusal and detail research by involving various knowledge disciplines such as mathematics, engineering, material and sociology and anthropology, potential in this expanded traditional Malay house would be able to give a very mean contribution in planning and modern housing design.

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