

PERSONALIZATION AS A MEANS OF ACHIEVING PERSON-
ENVIRONMENT CONGRUENCE IN MALAYSIAN HOUSING

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ABSTRACT

The aim of this research is to suggest design considerations for personalizable houses in Malaysian housing in order to support person-environment congruence that leads to housing satisfaction. The study focuses on the approaches of achieving person-environment congruence in house design through personalization. Data were elicited from housing schemes in Johor, Malaysia using a combination of questionnaire survey and means-end chain research methods. Due to insufficient number of Indian respondents, ethnic differences were not addressed in this research. The research revealed that owner-occupiers or users in the study area personalized their houses due to inappropriateness of the original house design. The personalization works were characterized by the significant number of personalization works undertaken before the users moved in. Intense modification had caused financial burdens to the users. The research found that personalization is an important approach in Malaysian mass housing because it is a means of achieving person-environment congruence, and it is a user participated home making. For design considerations, the study discovered that there were 5 important attributes for personalization namely forecourt, living room, kitchen, bedroom, and floor. Personalization of these attributes was influenced by values hedonism, family security, self-image, conformity, and tradition. The modifications were aimed at establishing users' expected affordances mainly everyday activities, communal activities, and pleasant feeling of home environment. To support personalization, the research found that the houses should have flexible internal layout and construction techniques. Users should be allowed to decide on the size and layout of the important attributes, to extend beyond building setback line, and to extend vertically. The research also suggests four user participation approaches in the process of personalization, they are user as developer, user as contractor, user works together with tradesmen, and user to handle all related works. These findings are potentially useful in establishing personalizable house prototype and personalization programmes in Malaysian housing.

ABSTRAK

Tujuan kajian ini ialah untuk mencadangkan pertimbangan rekabentuk bagi personalisasi rumah dalam konteks perumahan di Malaysia. Ia bertujuan mewujudkan *person-environment congruence*, kearah kepuasan di dalam perumahan. Kajian ini memberi penekanan pendekatan yang bersesuaian untuk mencapai *person-environment congruence* dalam rekabentuk rumah melalui personalisasi. Data diperolehi dari kawasan perumahan di negeri Johor, Malaysia menggunakan kombinasi kaedah soal-selidik dan *means-end chain*. Disebabkan responden dikalangan etnik India tidak mencukupi, kajian ini tidak membincangkan personalisasi dalam konteks perbezaan etnik. Kajian telah menemui bahawa pengguna di tapak kajian mempersonalisasi rumah mereka kerana rekabentuk asal rumah tersebut tidak bersesuaian dengan mereka. Personalisasi di tapak kajian menunjukkan sebahagian besar pengguna menjalankan kerja personalisasi sebelum menduduki rumah mereka. Kerja ubahsuai adalah intensif dan melibatkan kos besar yang terpaksa ditanggung oleh pengguna. Kajian ini menjumpai bahawa personalisasi adalah satu pendekatan yang penting di dalam perumahan bandar di Malaysia kerana ianya adalah cara untuk mengujudkan *person-environment congruence*. Ianya juga adalah pembentukan rumah yang melibatkan penyertaan pengguna. Untuk pertimbangan rekabentuk, kajian ini telah menjumpai 5 atribut penting di dalam kerja personalisasi iaitu laman hadapan, ruang tamu, ruang dapur, bilik tidur, dan lantai. Atribut personalisasi ini dipengaruhi oleh nilai hedonisma, perlindungan keluarga, imej-diri, kepatuhan, dan tradisi. Pengubahsuaian adalah bertujuan untuk mengujudkan *affordances* yang diharapkan oleh pengguna terutama aktiviti harian, aktiviti komunal, dan persekitaran rumah yang nyaman. Untuk memudahkan personalisasi, rumah tersebut perlu mempunyai susunatur dalaman dan teknik binaan yang fleksibel. Pengguna hendaklah dibenarkan untuk menentukan saiz dan susunatur atribut penting, untuk memperluaskan rumah melewati garisan anjak-belakang bangunan, dan untuk memperluaskan rumah secara menegak. Kajian ini juga mencadangkan empat pendekatan penglibatan pengguna di dalam projek personalisasi iaitu pengguna sebagai pemaju, pengguna sebagai kontraktor, pengguna bekerja bersama tukang, dan pengguna mengendalikan semua kerja berkaitan. Hasil kajian ini berpotensi untuk digunakan dalam menghasilkan rekabentuk rumah untuk personalisasi, dan dalam menghasilkan program personalisasi dalam konteks perumahan di Malaysia.

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LIST OF TERMINOLOGIES AND AVEBRIATIONS

- | | |
|--|---|
| Design | - “Design” in this research concerns with the definition provided by Bruce Archer as reported by Baynes (1976). Design is the area of human experience, skill and knowledge that reflects man’s concern with the appreciation and adaptation of his surroundings in the light of his material and spiritual needs. In particular, it relates with configuration, composition, meaning, value, and purpose in man-made phenomena |
| Formal Housing Delivery | - Houses that were produced according to the method, procedures and regulations outlined by the government. The provision of the houses is channeled through the government’s planning institutions, and the registered housing and finance institutions. Houses may be delivered by the public or the private sectors. (Nurizan, 1999) |
| Household | - A group of people who share the same roof (house). Generaaly this group consist of a man, his wife, children, and in some cases relatives (Smith, 1971) |
| Housing accommodation | - According to Housing developer’s (Control and Licensing) Act 1996 Housing accommodation includes any building, tenement, or messuage which is wholly or principally constructed, adapted or intended for human habitation or partly for human habitation and partly for business premises (.) |
| Housing developers (in Malaysian context) | - According to Housing developer’s (Control and Licensing) Act 1996, Housing developer means any person, body or persons, compony, firm or society (by whatever name described) engaged in or carrying on or undertakeing a housing development or desirous of doing so. |
| Housing development (in Malaysian context) | - According to Housing developer’s (Control and Licensing) Act 1996, Housing development are defined as business developing or providing moneys for developing, or purchasing or of partly developing and partly providing moneys for purchasing, more than four units of housing accommodation which will be or are erected by such development (Morshidi et.al, 1999). |
| Housing unit | - A collection of facilities for the exclusive use of a separate social group called a household. |

Informal Housing Delivery	- Houses that were built not conformed to the legal procedures, regulation, and standards stated by the government. Squatters' are the most dominating examples of informal housing delivery (Nurizan , 1999)
Low-cost housing (in Malaysian context)	- According to government guidelines during the development of the housing scheme in the study area (1980), low-cost housing was defined as housing units, which are priced at RM25, 000 or less. This unit can only be sold to households having a monthly income of not more than RM750. The type of housing units may be in the form of flats, terrace or detached houses with minimum design standard of a built-up area of 550-650 sq.ft (45 – 46 sq.m) , two bedrooms, a living room, a kitchen and a bathroom.
Medium-cost, and High-cost (Malaysian context)	- The definition of these types of houses is unclear. David Chua (drawing from Salleh (1997) suggests that medium cost houses are ranging from RM60, 000 to RM100, 000. High cost houses are those priced higher than RM100, 000.
Private developer (in Malaysian context)	- Non-government's institutions i.e.private institutions, co-operatives, individual and groups (Nurizan, 1989), who undertake housing production according to government targets and regulatory provision (Morshidi et.al, 1999). Other players in this sectors are financiers, professional consultants, and the builders.
Public Developer (in Malaysian context)	- Government agencies (Federal or State Government). Other public agencies include Urban Development Authority (UDA) and State Economic Development Corporations (SEDCs) (Morshidi et.al, 1999).
Public Housing	- Public housing is any form of housing which a government, quasi-government or municipal agency construct for sale or rental.
User	- Resident or occupant who is owner-occupier of the house.
ACV	- Attribute, Consequence, Value
HVM	- Heirarchical Value Map
MEC	- Means-End Chain
MDJBT	- Majlis Daerah Johor Bahru Tengah
PEC	- Person-environment congruence
RBD	- Registered Building Draughtsman
SPSS	- Statistical Package for Social Science
UBBL	- Uniform Building By-Law
UTM	- Universiti Teknologi Malaysia
SIM	- Summary Implication Matrix

CHAPTER 1

INTRODUCTION

The research is aimed at establishing design considerations for personalizable houses in Malaysian housing. To achieve this, the research focuses on the contribution of personalization as a means of achieving person-environment congruence (PEC) in one's living environment or house. PEC is conceptualized as the expected or favourable relationship between environment and the users (Popenoe, 1977). Therefore, personalization is explored based on the relationship between user expectations and the housing units. This research is carried out by examining the influence of user values on house concrete attributes in a selected housing scheme in the State of Johor, Malaysia

This chapter presents the overall structure of the research and framework in which the results of the enquiry are presented. The research problem under investigation will be presented in the first section. The second section outlines the scope of the research. The third section discusses the research strategy followed by research methodology in section four. The fifth section presents the relevance of this research while the overall structure of the thesis will be presented in the final section.

1.1 Statement of the Problem

Personalization in this research is referring to acts of making one's house unique to his/her personal intentions. The main issue addressed by this thesis is the widespread renovation practices in several urban housing schemes in Malaysia that

reflect people's eagerness to personalize their houses. Users' eagerness to personalize is highlighted by Tipple (2000), who reports that Malaysian transformer extent their houses as soon as they moved in. The current popularity of this practice also suggests that there are significant benefits generated from the practice that make it difficult to stop (Parid Wardi, 2002). A few studies (Boudon 1972; Tipple 1996 & 2000; Tipple et.al 1997; Altas and Ozsoy 1998; Methew 1995; Salama, 1996) on post occupancy alterations express the personal and social benefits obtained by the users from their house modifications. Tipple (1996) suggests that house extension improved user meaning of homes, sense of community, privacy, less crowded, etc. House owners in Pessac (Boudon, 1972) managed to cater to their individual needs and to create personal distinctions through house renovation.

In Malaysia, Parid Wardi (2002) argues that renovation practice produced more comfortable houses to live in, and increases resale values. Parid Wardi (1997) also highlights the importance of house renovation in meeting the changing needs of the occupants. Furthermore, house renovation practices have been considered as a "Malaysian culture" by the Ministry of Housing and Local Government Malaysia (1999). This is taken as an important housing perspective for the new millennium, as an approach that allows users to be involved in the making of their homes. Although personalization is seen as an important and potentially viable approach for a better house design in urban mass housing, studies on house personalization in this country that lead to its application are still lacking.

Some authors suggest that the prevalent renovation practice is due to the inappropriateness of the houses provided by developers in urban mass housing. Researches by Noor Sharipah (1991), Husna and Nurizan (1987), and recently by Siwar and Mohd Jani, 2003 on low-cost flats in Kuala Lumpur find significant dissatisfaction levels of the occupants with the houses. All of them suggest that the dominating factors causing the dissatisfaction include overcrowding due to insufficient number of bedrooms, and inappropriate room sizes and layout of the spaces. The aforementioned researches tend to agree with Tan's (1979) arguments that the houses' designs failed to address the needs of the households. Tan (1979) and Leong (1979) conclude that the inadequately and inappropriately designed

housing units to meet the cultural and religious needs of the occupant force them to make some alterations and adaptation to overcome the problems.

The inappropriateness of house design in mass housing stems from the nature of the formal mode of housing provision employed in this country. The formal mass housing provision system employed in Malaysia is similar to the commonly employed type by private sectors in other developing countries (Keivani and Werna, 2001), where the majority of the housing projects are undertaken by the private developers (Johnstone, 1980; Siwar and Mohd Jani, 2003); Nurizan, 1989; Ahmad Bashri, 2000). Until the more recent years, private developers remained the main housing suppliers in urban areas (Johnstone, 1980; Nurizan, 1989; Yap, 1991; Ahmad Bashri 2000; Siwar and Mohd Jani, 2003). The formal mass housing provisions in this country deny user participation in the design and construction process of the houses and this is considered as the major cause of user dissatisfaction (Noraini, 1993; Ahmad Bashri, 2000). According to Turner (1987) if people have no control or are not responsible for key decisions in the housing process, fulfilments of their housing need cannot be achieved.

The dominating financial concern among the private sectors (Yap, 1991) forces architects to concentrate primarily on maximising number on site and enhancing facades for marketing purposes. An adverse consequence is the poor design articulation to meet user needs (Madigan and Munro 1991; Ahmad Bashri 2000). The Housing Development (Control and Licensing) Regulation (a mechanism to control and regulate the rapid growth of private housing development in Malaysia) covers the economic and other financial aspect without adequate reference to design or environmental consideration (Ahmad Bashri, 2000).

Standardized house design is a common outcome of the formal delivery system that is frequently noted only in terms of cost (Ahmad Bashri, 2000). In Turkey, standardization in house design results in the occupants' characteristics and changing needs being neglected in the design (Altas and Ozsoy 1998). Similarly, in Malaysia the various socio-cultural needs of the people are neglected whereby the

multi-ethnic characters of Malaysian culture are not reflected in the design (Ahmad Bashri, 2000).

The scenario may have led to users feeling that the given houses are unsuitable. Questions, “How could the design be improved?” and “Can the architect in mass housing address the needs of every potential user and design accordingly?” arise. Rapoport (1982) seems to stress that it is difficult for architects to address every user’s expectations in the design process of housing schemes. The best available references are building standards and development guidelines, but standard of spaces can only be defined in terms of adequacy and not satisfaction (Brierley 1993). Personalization, as expressed by Priemus (1986) is an option when people are forced to live in an unsuitable environment. Therefore accommodating personalization in house design is an important area of study in order to provide an alternative approach to house satisfaction (PEC) in mass housing.

Also, studies on personalization should encompass the low and medium cost houses. Much of the previous researches on renovation and extension practice in this country put more emphasis on low-cost housing problems leaving the medium and high cost housing almost untouched. Works by Nurizan (1999) on Squatters’ Resettlement program in Kuala Lumpur, and by Azizah Salim (1998) on housing extension in low-cost housing schemes near Kuala Lumpur are of the low-cost types. Renovation in the Malaysian context as Tipple (2000) indicates is a remedy for the inadequately and poorly designed low-cost houses. On the other hand, medium-cost houses are regarded as posing lesser problems due to owners’ financial standing and being the primary target group of developers to gain profit in housing projects (Nurizan Yahaya, 1989). Therefore studies on personalization in house design in general are lacking.

If renovation (or alteration, extensions, etc) is viewed from the personalization concept, one may realize that the need to modify houses is universal, and includes all types of houses. According to Rapoport (1982, 2000), personalization is central in housing because it is the only way users are able to establish their meanings in the houses. It is about making one’s living environment

more personally relevant. Thus, it is fundamental in any house type. It is evident that house personalization is also noticeable among the medium-cost house owners in this country. The pre-survey of the case study area for this research shows that 62.8% of the owner-occupied houses have modified their houses. The actual number could be higher because this figure is only for renovated houses occupied by the owners themselves.

So far, the discussion has highlighted the centrality of personalization in Malaysian urban mass housing and the need to develop personalizable house design.. However, there are no design guidelines currently available in this country for that purpose. Previous studies on house renovation in this country have not led to any design guidelines to be used by architects in design process. Also, the existing house design guidelines (Jabatan Perancang Bandar dan Desa Semenanjung Malaysia, 1997) do not properly address the needs for house personalization. This is the research gap that this study intends to address.

To suggest design consideration for personalizable housing unit, this research examines the influence of user-values on house design. In marketing psychology, user value is regarded as a dominating factor that influence people's decision making in selecting products. Actions, according to the two prominent scholars i.e. Milton Rokeach (1973) and Shalom H. Schwartz (1994) are guided or transcended by one's values. Gutman's theory of means-end chain (MEC) that was developed from Rokeach value system, conceptualizes products' selection as being determined by one's values. The associations of user-values and product's attributes have been used in product design manipulations (Gutman, 1982).

Referring to the aforementioned theory of value, it is arguable that personalization acts such as changing the layout, putting new finishes on floors, enlarging spaces, self-expressions, etc. are transcended by user values. The previous literature on house modification discussed individual and family needs, cultural norms, social and economic reasons as the primary factors behind users' modification behavior (Methew, 1995; Brook et.al, 1994; Fenell, 1995; Sinai, 2001; Altas and Oszoy 1998; Morris and Winter 1975; Seek, 1983; Teasedale and Wexler,

1993; Shiferaw, 1998; Tipple, 2000). But none of the studies view those influencing factors as expression of user-values. Since houses in mass housing are regarded as products, their selection can also be considered as being driven by user values (Coolen and Hoekstra, 2001). The link between user values and house attributes will help this study to suggest design consideration for personalizable houses.

In summary, the nation urgently needs a proper house design that supports house personalization in urban mass housing. This implicates the need to broaden the way houses are designed; from designing based on designers intuition and by copying from the previous design, to designing with user knowledge taken into consideration (Margolin, 1997). House design needs to accommodate future personalization to suit user's expectations. Therefore the research gives emphasis on personalizable house design suggestions that is potentially useful for architects in urban mass housing.

1.2 Scope of the Research

The study of personalization in this research is directed towards establishing house design that accommodates personalization. Personalization in this study is related to the act of modifications of houses' fixed features (unmoveable components such as walls, structures, floors, etc) with the intention to achieve PEC. Therefore, any act of modifying one's house such as "alteration", "extension", "remodelling", "adjustment", "transformation", "display", "marking" etc. aiming at achieving PEC can be considered as an act of personalization. However, personalization by rearrangements of semi-fixed features (moveable furniture, picture frames, paintings, etc.) are not emphasised in the study. Fixed-features' modifications can be considered as extreme cases of personalization if compared to Rapoport's (1982) suggestion that personalization is referring to rearrangement of semi-fixed features. Fixed-features modification would implicate much higher financial burdens than that of the semi-fixed features. It reflects the eagerness of the users to personalize, thus

indicate that there are motivational factors that force the user to undertake what Lang (1987) terms as “difficult surgery”.

The research firstly investigates the characteristics of personalization in Malaysian urban mass housing. The background of personalization works in the case study area are analysed in terms of user eagerness to personalize, suitability of the original house design, intensity of alteration, cost of alteration, and frequency of alteration. User’s satisfaction level with the outcomes of personalization works is examined to indicate the state of PEC of the houses. This is important because achieving PEC reflects the suitability of the modified environment to the users (Bell et al, 1996). The level of PEC achieved through personalization works will strengthen the importance of personalization, hence the need to develop personalizable house design.

The research needs to investigate factors that determine the users to personalize. Taking Coolen and Hoekstra’s (2001) argument that house preferences are determined by user-values, and house modification can be assumed as being influenced by the same determinant. Therefore, the means-end chain (MEC) model that was used by Coolen and Hoekstra (2001) in their housing preference research is considered as an appropriate method to examine personalization of the houses. The collected data are used to identify the emphasized house attributes in personalization, the expected affordances from the attributes, and the user values that influence the modification of the attributes. The data is vital in formulating suggestions for the design of the attribute that accommodate future personalization.

Flexibility of house design is important in facilitating personalization (Tipple, 2000). He indicates that aspects such as setback requirements, size and shape of the plots, and positioning of the original house design affect flexibility of future house modification. To further suggest design flexibility (or personalizability), the research attempts to collect data on the actual modifications of concrete attributes (particularly the spaces). These data are triangulated with the emphasised attributes in order to identify, if any, constraint posed by the original design in achieving what are expected from the emphasized attributes. In this way, personalizable house design suggestions can be characterised.

Personalization is a user participated home making, and it is often initiated by the users themselves (Carmon and Gavrieli, 1993). Therefore, the study also examines user involvements in the design and construction process of personalization. This is based on the arguments that involvement of users in house production has been seen as a key factor in achieving satisfaction (Turner 1987). To suggest ways to optimise user participation in personalizable house design, data on user participation in design and construction process, assistance received from the architects, other professionals, contractors, and tradesmen are collected and analysed.

It is important to highlight that this research does not address ethnic differences in the analysis, although the respondents represent the different ethnics live in the study area. This is due to the insufficient number of respondents for analysis (see Chapter 3).

To limit the research to a manageable size, the study is addressing only individual house's personalization. The term "house" in this study refers to "housing unit" defined by Smith (1971) as a collection of facilities for the exclusive use of a household. Other terms such as "dwelling" and "residence" that might appear in this research are considered as having the same meaning as "house". The selected houses for this study are limited to those with the criteria defined by Meert (2004): -

- i. Have a legal title to occupy,
- ii. Have an adequate space over which a person and his/her family can exercise exclusive possession,
- iii. Able to maintain privacy and enjoy social relation.

The term "household" means a group of people who share the same house (Smith, 1971). This group consists of a man, his wife, children, and in some cases with other relatives. The research concerns with personalization of houses in the context of urban mass housing that fall into the following criteria: -

- i. Developed by private housing developers through the formal housing provision. The main reason for limiting this study within this housing context is that this mode of housing delivery produces the majority of houses in urban areas (Johnstone, 1980; Yap, 1991; Siwar and Mohd Jani, 2003). Houses provided through informal housing particularly squatters are mostly considered as illegally produced (Nurizan, 1998), and are therefore excluded from the study. Self-provided houses are also excluded because in these modes users tend to directly involve in the delivery process.
- ii. Owner-occupied houses. The houses to be included in this study are those, which are owner occupied. This is based on previous suggestion that personalization (house extension, renovation) was mostly carried out by the owner of the houses (Seek, 1983; Tipple 2000). According to Baum and Hassan (1999), only the house owners are able to undertake substantial house renovation. Therefore the term “user” is referring to owner-occupier of the house, not tenants.
- iii. Landed properties. This research focuses on landed houses, thus multi-storey housing is excluded. From casual observation, fixed-features modification in multi-storey housing or flats in this country is uncommon, although the practice can be seen in Egypt (Salama, 1996). To further limit the scope of this research, only single storey low-cost and single storey medium cost houses are selected for the study. Including double storey houses into this research would implicate more works needed to collect data on physical changes of the houses, thus higher cost implication and time consuming.

The scope of this research also implies the application of the findings and design suggestions, expected to be applicable to personalization of houses provided through the modes explained earlier in this section. However, some design suggestions are expected to be applicable to double storey houses and detached family houses provided by developers or by the users themselves.

1.3 Research Agenda

1.3.1 Research Aim

The aim of this research is to establish design considerations for personalizable houses in Malaysian urban mass housing in order to support person environment congruence (PEC) in home making.

1.3.2 Research Questions

The key research questions for this thesis is: -

- i. Why do users personalize their houses?

This question leads to more detailed sub-questions: -

- ii. How can user participation be supported in house personalization projects?
- iii. How does personalization influence the design of houses in urban mass housing?
- iv. How does the design of houses affect personalizability

1.3.3 Research Objective

- i. To identify the characteristics of personalization in Malaysian urban mass housing.
- ii. To identify approaches that support user participation in personalization projects.
- iii. To establish design consideration for personalizable houses based on user-values associations with house attributes.
- iv. To establish design considerations for personalizable houses based on design personalizability.

1.3.4 Assumptions

- i. Personalization support person-environment congruence
- ii. Personalization links user-values to house attributes
- iii. Personalization requires user participation

1.4 Research Methodology

The research is a case study that employs a combination of qualitative and quantitative methods. The quantitative method is a survey done via questionnaire and to be analysed using Statistical Package for Social Science (SPSS). The qualitative method is using Means-End Chain research model. The reason for combining two different data collection and analysis methods is due to the nature of the required data. For example, data on generalized pattern of personalization such as user participation, modified house attributes, and alteration intensity levels are to be measured quantitatively. Thus, those data are more appropriately collected using survey questionnaire. Qualitative data (user-values, personal feelings, preferences, etc.) are subjective, in-depth, and sometimes unpredictable thus more appropriately elicited using MEC methods. The two methods have their own strengths and weaknesses. Therefore, the use of the two methods will assist in data triangulation, and also help to overcome any of the potential weaknesses in each method. There are three main phases in this research; literature review, data collection, and data processing.

1.4.1 Literature Review

A review of literature is conducted to establish the theoretical framework of the research. There are two major aspects of the research that are reviewed; the theory of personalization and the theory of Means-End Chain. Several existing theories are evaluated in relation to the key aspects that include the concept of

person-environment congruence (PEC), theory of affordances, user-participation, user-value, attributes, and consequence. Literatures on research methodology are also reviewed to help develop the methods used in the research.

1.4.2 Data Collection

There are two methods of data collection employed in this research; 1) questionnaire survey to collect quantitative data, and 2) MEC laddering interviews to collect qualitative data. The quantitative data consists of information on houses' characteristics, respondents' characteristics, background to house alteration, physical modification of the houses, alteration outcomes, and user perceptions on alteration outcomes. The collection of quantitative data is carried out using researcher-administered questionnaires on a selected case study location i.e. Taman Sri Pulai, Johor. The variables in the questionnaire are designed by the researcher.

The qualitative data is related to the user values that influence the modification of houses' concrete attributes. The expected responses are house concrete attributes modified in the personalization works, functional and psychological benefits (consequences) obtained from the work, and user values that motivated the works. The technique of data collection is a semi-structured interview known as "laddering interview". The raw data is recorded in the form of attribute/consequence/value networks that is termed as "ladders". The data from this technique of data collection are respondent's bias.

To support the aforementioned verbal data, visual data are also collected. This, according to Emmison and Smith (2000) helps eliminates biasness of users in presenting the verbal data. In this research visual data (the only non-verbal data collected) are used in data triangulations, and to further clarify the verbal data. There are two types of visual data collected; 1) plans of the original and the modified designs, and 2) photograph of elements in the studied houses.

1.4.3 Sampling

The two different research methods also imply two different methods of sampling. The term “sample” is referring to the questionnaire survey method, where the number of respondents are calculated based on the total population of the case study location (Yin 2004). For MEC model in this research, respondents are not considered as representatives of the population, but they are data source from which information are elicited. Unit of analysis is “word”, therefore the number of respondents is seldom referred to in MEC method (Reynold and Gutman, 1988; 2001). The houses of the respondents are the “cases”. Unlike “samples”, “cases” are not selected based on statistical calculation (Yin, 2004), but based on variations needed for the analysis.

Sampling technique adopted for the questionnaire survey is stratified random, and the populations are owner-occupied renovated houses. The respondents are those involved in the personalization project and are expected to represent the low and medium cost house groups. There are 145 samples obtained from a population of 1122 owner-occupied modified houses. The number of cases selected for the laddering interviews is 15. They are selected among the survey respondents who are “satisfied” or “very satisfied” with the outcomes of their personalization works. Variation in terms of ethnic, house position, extents of modification, are used in determining the appropriate houses to be studied.

1.4.4 Data Processing and Analysis

The survey data are analysed using the Statistical Package for Social Science (SPSS). Analysis of the data is performed descriptively, using frequency and cross tabulation. The research also cross tabulates the “satisfaction level” with other variables to examine if any “significant” relationship exists between satisfaction and the variables. This is to find out the way in which satisfaction levels are related to the

concept of “person-environment congruence (PEC)”. Chi-square test is selected to perform the significance tests.

The MEC data are processed manually. The interviews are tape-recorded, and later transcribed into written form. The written data are tabulated for content analysis from which “ladders” are constructed. Ladders are considered as raw data that provide units for analysis. Unit of analysis is “word”, or “sense of “word” or “sense of sentences”. The analysis is performed using the traditional method of MEC described by Reynold and Gutman (1988, 2001) with some modifications. All data from questionnaire survey and MEC are triangulated in the discussion of the findings.

1.5 Relevance of the Study

This study attempts to suggest new approaches for personalization as a means to achieve PEC in houses. It is also suggested that the properly designed houses, which accommodate future personalization are able to facilitate and encourage continuous house improvement. With personalizable house design, financial burdens due to fixed-features modifications can be minimised, and user participation can be properly organised. This will enable users of urban houses to shape their houses according to their needs and expectations. Therefore, personalization is considered as a viable approach for sustainable housing in Malaysia’s urban areas.

The research provides framework to support personalization in urban mass housing. This includes suggestions for guidelines in developing personalizable house design that includes modes of user participations in personalization projects, and design suggestions for personalizable houses. The suggestions also imply some modifications in planning and building regulations to encourage personalization. The findings, particularly the links between user-values and house concrete attributes, can be manipulated into house design strategies, guidelines, and control measures. According to Gutman (1982), knowledge on which product attributes are expected to

produce the desired consequences is useful in product development strategies. The same is assumed to be applicable to house personalization.

This information is potentially useful for architects in the development of personalizable housing unit designs. Knowing which house attributes emphasized by certain values help designers to appropriately address house attributes in the design process. The information also enables designers to identify the tendencies of certain attributes to be modified in future personalization works. This will give clues to the designer in the design of personalizable housing prototypes.

Study on personalizability in this research will lead to developing flexible house design and construction systems. With flexible house layout and flexible construction techniques, fixed-feature modification can be minimized. Hence, unnecessary financial burdens on the users can be avoided and personalization can be encouraged.

1.6 Structure of the Thesis

This thesis is made up of four main parts. Part One that is represented by Chapter 1 is the introduction to the thesis. Part Two is for literature review that consists of two chapters (Chapter 2 and 3). Chapter 2 elaborates on theoretical frameworks used in this research that include the theory of personalization and MEC, the concept of “affordance” and “Person-Environment Congruence”. Chapter 3 discusses research instrumentation. This chapter explains in-depth the research methodology used in this research that includes sampling, data collection methods and analysis of the data.

Part Three discusses the characteristics of personalization in Malaysian urban mass housing. It consists of two chapters, i.e. Chapter 4, 5. In Chapter 4, the factors that characterize personalization in Malaysian urban mass housing are discussed. Achievements of PEC in the completed works are also analysed. This is particularly

vital to strongly indicate the need to propagate personalization in Malaysian mass housing. Chapter 5 discusses user participation and its significance in personalization to further support the importance of personalization. Suggestions on the involvement of users, architects and contractors in the design and construction process of personalization projects are also discussed in this chapter.

Part Four contains suggestions for house design that support personalization. There are two chapters in this part i.e. Chapter 6 and 7. Chapter 6 elaborates on the influence of user values on house attributes. The emphasized attributes are thus identified. Design implications for those attributes are analysed, from which design requirements for personalizing those attributes are suggested. Chapter 7 discusses personalizability of the studied houses. Design considerations discussed in Chapter 6 are compared with the original design of houses in the studied houses in order to analyse constraints in personalization works. The results are discussed in terms of suggestions to increase flexibility to facilitate personalization.

Part 5 consist of Chapter 8 that concludes the results of the study by relating the findings with the research questions, and the assumptions. Implications of this research on various aspects of housing theories, and recommendations for further researches are also suggested. Part 5 also includes the research bibliography and appendixes.

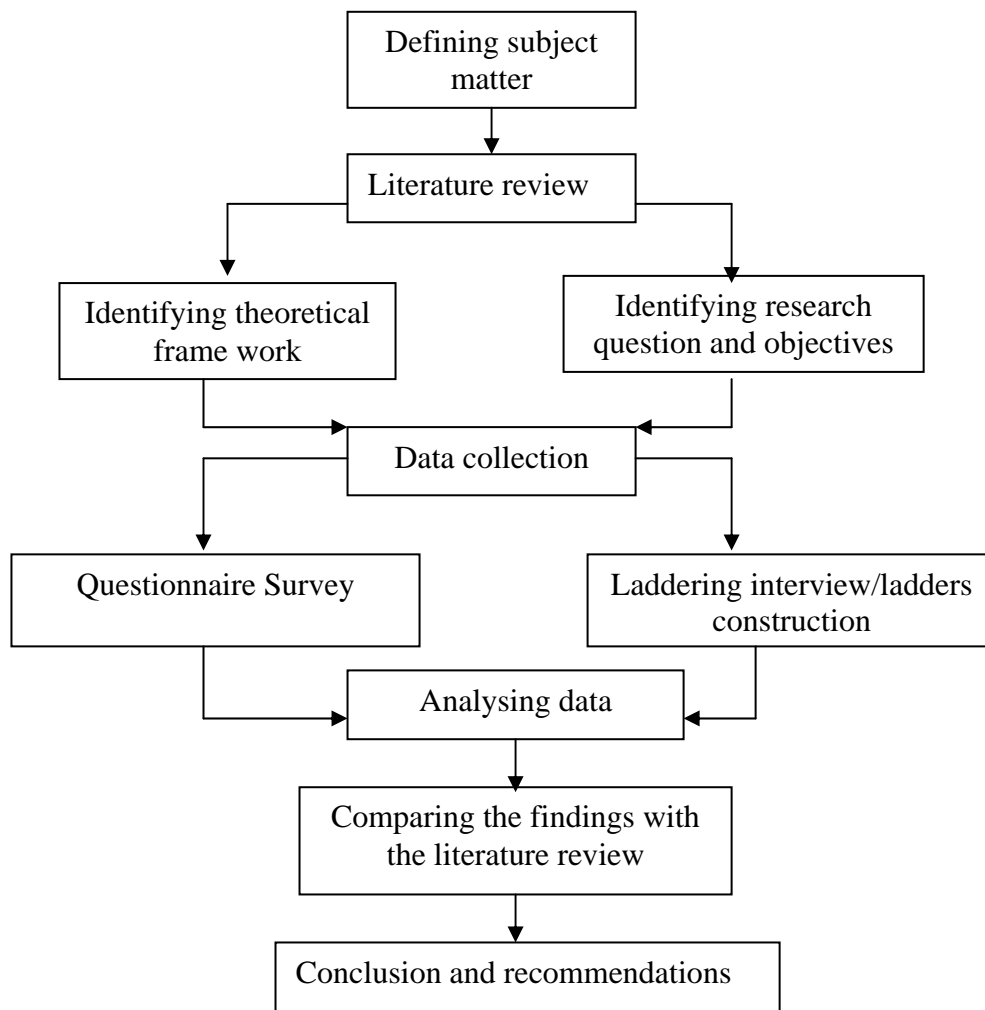


Figure 1.1: Structure of the Thesis

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