PERSONALIZATION AS A SUSTAINABLE APPROACH TO MASS HOUSING: THE FUNDAMENTAL THEORY

MAHMUD BIN MOHD JUSAN
Department of Architecture, Faculty of Built Environment, Universiti Teknologi Malaysia
UTM Skudai, Johor, 81310, Malaysia
e-mail: b-mahmud@utm.my

ASSOC. PROF. DR. AHMAD BASHRI BIN SULAIMAN
Department of Architecture, Faculty of Built Environment, Universiti Teknologi Malaysia
UTM Skudai, Johor, 81310, Malaysia
e-mail : ahmadbashri@hotmaiL.com

Abstract

Standardised house design is commonly employed in current mass housing in Malaysia. Although all completed houses are assumed to have met the building and planning regulations, the current renovation works indicate the 'failure' of the design to meet the expectation of users of different backgrounds. This paper propagates "personalization" as a sustainable means of achieving sustainable living environment. Personalization is an act of marking and changing in order to impose control on one's territory. The act ranges from furniture rearrangement, putting up displays to structural modification of living units. "Personalization" is essential and a continuous process in housing because people's physical and psychological needs are ever changing. In mass housing personalization, user participation is central because home environment is an extension of man's existence and personality, hence man is an agent of environmental change and not merely a recipient of environmental influences. Man should be able to manipulate, shape and alter the environment to meet their needs. Instinctively man is directed by his goals in which to achieve this, he has to interact with his physical and non-physical environments. Cultural influences, particularly the multi-ethnic user values are seen as determinant to selecting and changing housing unit's attributes. Although renovation works have been in practice in this country for a long time, there is no proper framework established to accommodate the potentially viable approach for a better sustainable and quality home making. This paper suggests a possible framework of personalization that is prerequisite to developing future house design prototypes.

Keywords : Personalization, User values, Housing units attributes, Personalizable housing design, User participation.

1. Introduction

Sustainable development as defined by World Commission on Environment and Development (Lee 2004) are those that meet the needs of the present without compromising the ability of future generations to meet their own needs. It embraces a long term perspective that looks beyond current problems, searching for durable solutions. It seeks the equitable distribution of goods and services, and addresses the present and future well being of the people. It also posits an environmental perspective, aiming at maintaining and enhancing the natural resource base. Lee (2004) further suggests that sustainable housing is an issue of the long term well being of families that live in it: how it affect their health and welfare; whether the housing encourages or discourages social interaction; or is it managed in a way that combat social exclusion. Sustainability is not only about natural resources, although we must be rational with the use of water and energy (Lee 2004). Generally, studies on housing are addressing a wide range of sustainable issues on housing, such as environmental sustainability, economic sustainability, social sustainability etc.

In the context of this study (Malaysian Urban mass housing), it is suggested that the post occupancy modifications of houses (termed as "personalization") be recognized as an approach for housing sustainability. Personalization is a continuous process to ensure the houses are in the state of "person-environment congruent", a concept that is vital in living environment (Barker, 1968) without which arousal, overload, reactance, and other responses will occur. This approach allows the users to be involved in the design or improvement of their living environment, where public participation is one of the fundamental prerequisites towards achieving sustainable development (UN, 1992:23.2).

Personalization in housing provision may be considered as a "self-provision housing", an approach described by Duncan and Rowe (1992) and Clapham et.al (1992) as the hidden housing arms of the developed countries. In the same token Gosling et.al (1992) posit that house extension is a form of housing development. "Self-provision" concept of housing is a kind of self-help, and these two terms have been used interchangeably by various authors. Self-help is very much referring to Turner's (1978) works in Latin America where the users involved in all aspects of house construction (even in design process) with or without the helps of professionals. In the developed country, self-help (self-provided) housing by moderate and low-income group is commonly found in the form of house improvement rather than new housing construction (Carmon and Gavrieli 1993). Centrality of personalization remains the same in both self-provided new housing and self-provided house modification.

Personalization is about quality home making within the "standard" set by the households themselves. Cost saving is also proven in this method of housing provision (Duncan and Rowe, 1992). Therefore, personalization is a sustainable housing approach that enables users to have an affordable quality houses.

The emphasis of this paper is on personalization in the context of Malaysian urban mass housing, particularly the ready-built houses developed by private developers using the formal mode of provision. Personalization in the context of residential neighbourhood, self-provided new houses in urban or rural areas will not be included in the discussion, though the authors realize the relevance of personalization in these housing aspects. The paper will be divided into two parts. In the first part, suggestions will be made to modify and expand the existing theory of personalization. This theory forms a theoretical framework from which the development of personalization framework for urban mass housing is formulated. Part two is dedicated to suggestions on the fundamental aspects of the proposed personalization framework. The suggestions are based on the authors' ongoing studies on the renovated houses in Johor Bahru, Malaysia.

2. The expanded theory of personalization

2.1 What is Personalization?

Personalization is an act of marking one's territory (Becker and Coniglio 1975; Lang 1987; Bechtel 1997), which is a mechanism to achieve privacy, hence user control of his environment (Lang 1987). Personalization, as discussed by many authors (Rapoport 1982, 1990, Bechtel 1997, Lang 1987, Bentley 1986) seems to refer to non-structural modification such houses' interior layout, finishes and decoration that involve movable items. However, the basic theory of personalization may also relate to structural modification of the houses, although attempts must be made to reduce cost implications. In many studies, this modification process is known by many terms such as house extension, renovation, modification, transformation and house remodeling. This practice is well known in various Asian countries including India, Egypt, Bangladesh, Kumasi, Harare and also Malaysia (Tipple, 2000). The authors also suggest that moving is an act of personalization because the theory that led to moving from or modify the place is the same (see Fig.1). The decision is generally influenced by constraints such as housing market situation, regulations, financial situation, accessibility to housing information etc. (Priemus 1986, Rapoport 2001, Sinai 1998, Speare 1975),

2.2 The Significance of Personalization

(i) Personalization is a way to establish user meaning of built environment (Rapoport, 1982). It is also a process of generating environmental meaning that lead towards achieving one's values and goals.

Values came from culture that creates and determines needs, which is significant in determining users' housing choices.

(ii) Personalization is particularly essential in housing because of the wide differences between users' and designers' values, and the difficulty to meet the precise needs of the users by the designer (Brierly, 1993). In housing, user values and meanings are more important (Rapoport, 1982; Rapoport, 2000). The current scale of adaptation and renovation is a testimony to this fact.

(iii) Personalization is a continuous process where the individual characteristics and values are emerging with the times and new needs. Building houses is a natural human activity. A Chinese proverb says "the day the man stops building his house is the day that he dies" (Keyes, drawing from Ahmed 2003). This suggests that even if the existing living environments are properly designed, personalization will continue due to naturally changing needs and behavior of human being. What is required is the implementation of a systematic personalization framework to avoid unnecessary high costs in home making.

(iv) Personalization demands users to participate in their home making. The environment is an extension of man's being and personality, hence man is an agent of environmental change and not merely a recipient of environment influences. He should be able to manipulate, shape and alter his environment (Altman 1976). Being directed by his goals as man's instinct and to achieve this, he has to involve and exchange with his physical environments Proshansky et.al (1974). Involvement of users has the potential for producing environments, which are not only safer and cared for, but also tailored to the needs of users due to the fact that the residents were involved in making decision relating to their house and their immediate residential environment (Wilkinson, 1999). Therefore the personalization framework must include a proper approaches or programmes for user involvements. There is a belief that today we shape the environment and tomorrow the environment will shape us. Therefore, the users must have a say in their future.

2.3 Theoretical Model of Personalization

The theoretical model of personalization that the authors developed depicts the above theory (Fig.1). Built environment is defined by its attributes (Rapoport 2000). Since most of us work and live in environment designed by others (Bentley 1986), the given environment will be first filtered and evaluated by the person's filtration system. Culture is suggested as the main agent of this filtration process, which in a broad term encompasses the measurable variables such as values, ideals, norms, standards, needs, characteristics etc. (Rapoport, 2000). The consequence of this filtration or evaluation process is whether or not the user finds the house as suitable (person-environment congruent). There are two ways to cope with conflicting situation (person-environment incongruent). One is to adapt by changing family norms or standards (Sinai 1998, Bell et.al 1996) and remain in stresses, while another option is to personalize. Personalization however is constrained by several factors such as financial availability, market situation, social ties, planning and building regulations etc. These constrains are determinants to whether the users move or modify. This process will be repeated in which ever decision the user made. An important point is that, although the users have reached some satisfaction, the situation will not last. Due to changing needs during their life, they would later find their houses to be inadequate (person-environment incongruent).

2.4 Value as Environmental Filter and Evaluation

Values are expression and understanding of culture (Rapoport's 2000, Rokeach 1973). Culture is defined as a shared organization of ideas that includes the intellectual, moral, and aesthetic standards prevalent in a community and the meanings of communicative actions (LeVine 1984). Culture defines and distinguishes among groups i.e. pseudo-species (Rapoport's 2000, 2001), where in the context of man-environment relationship, it is the man made part of the environment (Herskovits 1948). This definition is expanded by Triandis (1980) to include physical culture (physical objects: roads, buildings and tools) and subjective culture (subjective responses to what is man-made: myth, roles, values and attitudes) In living environment groups differences has led to culture-housing relationships which can be realized by the different forms and styles especially with the vernacular design (Rapoport 2001). Values are at the core of a culture and influence the perception of symbols and rituals among others. When used to characterize and distinguish between cultures, it represents socially shared abstract ideas

about what is good, right and desirable (Hofstede, 1994). For example, in product promotions, understanding a country's core values is of paramount importance, without which miscommunication in advertising is likely to occur (Watson et.al. 2002). Due to it's influences on a country's characteristic and consumer behaviour, values serve as the criteria where its members use to determine what behaviour is appropriate; to guide self presentation and to justify their choice to others (Watson et. al. 2002, drawing from Rokeach 1973). In housing, values help define groups and make housing particularly important, because dwellings play an important role in acculturation and, hence the survival of groups through the transmission of values, linking values to family (Rapoport 1982, 1990). In Singapore, religious values of three groups (Malay Chinese and Indian) lead to different problems in standardized housing, and the more severe problems being linked to activities rather than symbols (Chua, 1988). Therefore, values influence preferences and choice (Rapoport 2001, Coolen and hoekstra 2001).
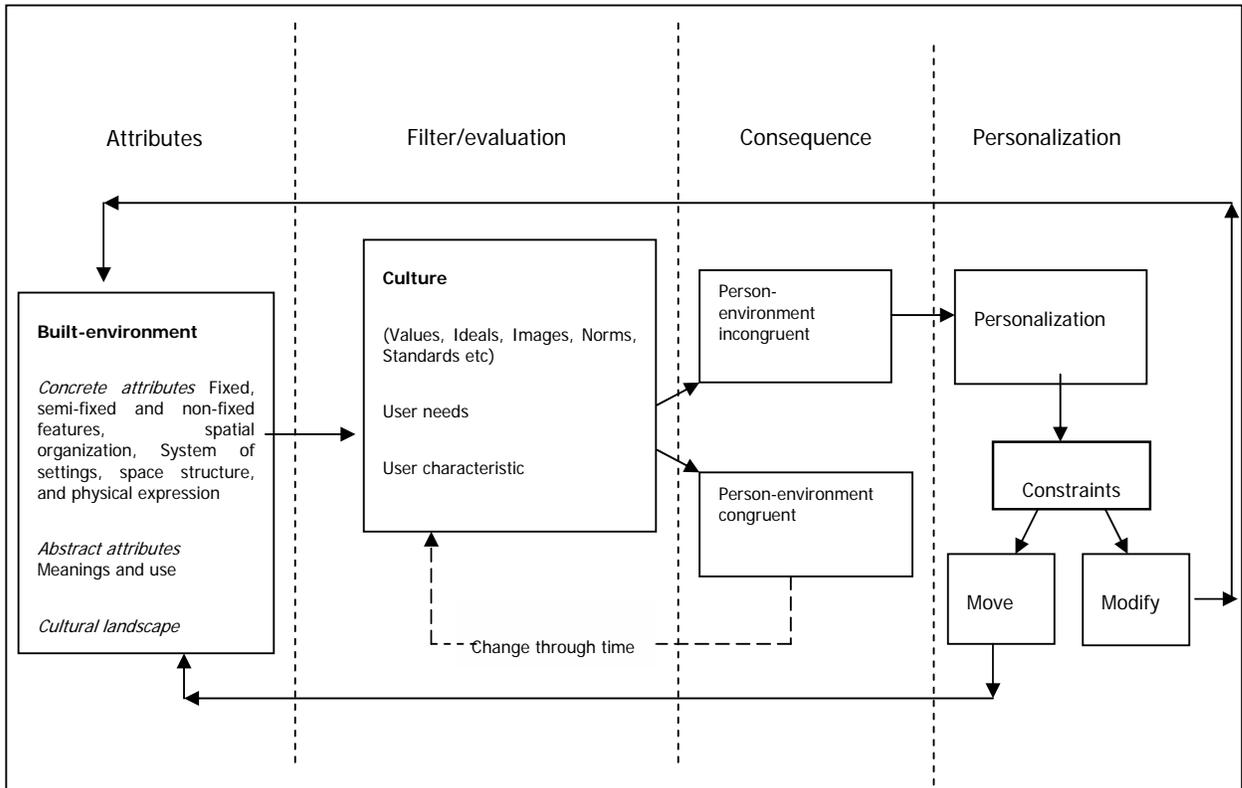

Fig.1 Theoretical model of personalization in built environment. Source; the authors

Values are often expressed through ideals, images, schemata, meanings etc (Rapoport 2001). For example, a caption " turn your home into paradise" is used to describe a façade with roof pediment, window pediments and columns (Rapoport 2001). How people perceived environments depends on his/her values. Unfortunately the importance of user values in decision-making in the design of built environment has seldom been emphasized, although in products' marketing it has been widely applied. It is suggested that value must be included as an important design consideration in order to achieve sustainable housing through personalization framework.

2.5 Conclusive Remarks

This article therefore suggests to conceptualise personalization in two ways: -

(i) Personalization as an essential and continuous process of achieving users' goals in built environment through physical and non-physical modification of their environment. This includes decoration, display, rearrangement of movable items, altering family norms and composition, and structural modification of the houses.

(ii) Moving is another activity to meet users' goals and is influenced by the same factors as for non-moving.

The authors also advocate that personalization is a potential housing development arm in providing quality and sustainable living environments that suites users' income streams. Tipple (2000) in his book "Extending Themselves" lists down several practical advantages from house transformation activities (the authors of this article consider transformation as an act of personalization). Together with his suggestions, the benefits of personalization may be summarized as follows: -

- Housing consumers become producers of housing
- Personalization saves money and other resources
- Personalization allows users to modify in order to establish their meanings and use of homes
- Personalization is an effective housing production arm at affordable cost for low and higher income groups.
- Personalization improves the social, economic and environmental quality of the living environment
- Personalization increases the productivity of housing
- Personalization enriches the use and function of homes
- Personalization adds value to an area and increases the potential property tax base
- Personalization makes efficient use of existing social resources
- Personalization promotes better social integrations.
- Personalization produces variety out of uniformity
- Personalizable housing concept is a potentially attractive housing option for housing buyers.

3. The Need for a Personalization Framework

The authors (2003) highlighted the 'popularity' of renovation practices in almost all urban mass housing schemes in Malaysia, and urge the housing actors to establish some kind of framework to facilitate this act of personalization.   It is suggested that any personalization for living environment in this country should (i) address the varying and changing needs of the multiethnic users, (ii) allow the architects and the developers at the earlier stage of the design process to consider the possibility of user personalization to take place during occupancy, (iii) minimize structural modification of the houses when personalization takes place, (iv) defining the extents of the flexibility, open endedness, and adaptability of the original design in order to strike a balance between individual freedom of choice and planning control which is essential to ensure the sense of unity of the environment, and (v) minimize financial burden to the users, developers and the nation.

It is suggested that the key characteristics of a living environment that allows personalization is flexible and open-ended. The term 'personalizable' is introduced by the authors to describe the criteria of a living environment that is flexible, open-ended, and modifiable (FOM) to meet the user's expectations. Therefore 'Personalizable house' means a house that is flexible, open ended and modifiable for the above-mentioned purposes.   With these key characteristics, a 'personalizable houses' enable the multiethnic users of this nation to establish their meanings of homes. The extent of 'flexibility', 'open-endedness', and 'modifiability' (FOM) is assumed to be defined by several factors including housing policies, planning and urban design control, construction and structural systems, building regulations, and user's characteristics. Planning and building regulations are necessary to define the extent of personalization 'freedom' that is given to the users. This is particularly vital to ensure users' personalization practices will not adversely affect the environmental sense of unity, neighbourhood character, structural soundness of the building, and other technical aspect of the house and the locality.

Modification without affecting the fixed features of the houses (wall, columns, roof, etc) is considered as an ideal situation. As posited by Rapoport (1982), modifications should affect only the semi-fixed features (such as demountable partitions, furniture, picture frames, etc). In the contexts of economy, this notion may directly be related to minimising financial implications on the users in personalizing their houses, and eventually the nation's spending on 'housing developments'. However the authors suggest that allowing the users to modify the fixed-features may increase the level of personalizability hence users' freedom to achieve their design expectations. This level of flexibility and modifiability would immediately implicate the need for the appropriate architectural design and construction systems.

Personalization must be considered at the design stage, in which the architects must be fully aware that the houses they designed will be subjected to future alterations. Architects should be working towards helping and supporting the users to establish their dream homes.

It is observed from an ongoing study on house renovation that the current practice of personalization in this country apart from being a financial burden, it is unorganized, uncontrolled, unsystematic, and often led to unexpected and chaotic neighborhood character. Professional helps acquired by the users are mostly due to municipality's requirements rather than to suggest good design. Cases where users wrongly appointed inexperience contractors, and being cheated by the contractors are common. Therefore in order to optimize the benefits from personalization, a framework is needed to be established.

The authors suggest that the personalization framework should consist of (i) Design, (ii) Construction Technology, and (iii) Enabling strategies.

4. Design

There are 3 major design aspects introduced that differentiate between personalizable house design and the commonly practiced design approaches in Malaysian urban mass housing, namely   (i) Identification of users' values – housing attributes relationship (UVHAR), (ii) User participation, and (iii) personalizable house design

4.1. Identification of UVHAR

The personal goals and values are the motivational factors that help users to make decision in choosing the kind of houses they wish to possess, and the attributes are the means through which they may achieve those goals or values (Mahmud 2004, Mahmud and Ahmad Bashri 2004). The nature of user values-housing unit attributes relationship will provide important cues in defining the extent of flexibility and open endedness of the design.

The immediate concern is the use of the existing building standards and regulations. Building standards or building regulations such as number of room, sizes, opening, etc. are found to be only about adequacy, not quality (Brierly, 1993). It is insufficient to ensures user's satisfaction or achieve users housing goals. The authors suggest that for urban mass housing in this country, the multiethnic values about home must be first recognized in all sectors in housing production in order to turn housing into user centered architecture. The authors consider this as an essential component in the design process that will support housing sustainability.

The ongoing study on modified houses using Means-End Chain Model (Mahmud and Ahmad Bashri, 2004) have shown that user values have significant influence on the housing unit's attributes (spaces, furniture, decorations etc). This has been reflected by the way the users changed the original design of their houses. The study also found that there are three important points about the implication of user values in relation to house attributes: -

(i) Users perceive house attributes differently.
Different users perceive House attributes differently. For example, kitchen is perceived by some as a place for family gathering, children upbringing, space for ladies etc. Likewise living room is regarded as a place for family gathering, self-expression and to certain extent as an alternative sleeping room. There are users who emphasized on furniture where home making were based on their types such as collapsible, self-made, antiques, etc. As a result modification of the existing structures were minimal. Several other users have altered the existing spatial layout, changing the existing function, adding new spaces, adding new finishes and decorative elements to the floor and walls, changing the façade design, putting up religious icons, personal identities etc. Structural modifications in these cases are more significant.

(ii) Users prioritise house attributes differently
The study found that users emphasise spaces in their house differently. Kitchen, forecourt including front gate, and living room have been repeatedly mentioned as users' main concern in personalizing

their houses. When the users were asked to arrange the spaces according to priority, the responses were varied, although kitchen and forecourt seem to be of popular concern.

(iii) Intention for future modifications
Several respondents have intention to alter their houses in the future, despite the fact that many of them have done house modification for more than once. This may be seen as an irony in the theory of personalization. Although the earlier modifications of the houses were done by the involvement of the users, they still intend to change the design in the future. This may be attributed to changing values, needs and even life goals.

Therefore it is necessary to identify UVHAR in the design process that may be established by carrying out post occupancy interviews using Means-End Chain model (MEC). It is suggested that the findings of MEC interviews will be able to show the links between user values and house attributes. The findings will be useful as a reference for the designer to identify and evaluate housing unit attributes beyond the dimensioning requirements as normally expressed in the building by-laws.   MEC interviews may also be carried out on the potential buyers of the house.

4.2 User participation

As highlighted earlier, user participation is one of the main components in personalization. The question now is how the users would effectively participate in the future improvement of their home. Participation means 'having a share in' (Damer and Hague, 1971-Drawing from Ahmed 2003), and also suggests 'empowerment of users' (Johnson, 1984 – drawing from Ahmed 2003). To be socio-culturally appropriate, an environment should have, as a primary element, the contribution from its future residents (Bhatt and Navarret 1991). Wulz (1986) suggests seven stages of user participation in the design decision-making process between the two extremes of 'representation' of the users by the designers (expert autonomous architecture) and 'self-decision' by the users themselves (user autonomous architecture). The stages are (i) Representation, (ii) Questionary, (iii) Regionalism, (iv) Dialogue, (v) Alternatives, (vi) Co-decision, and (vii) Self-decision.

User-participation particularly the self-help concept, have been regarded as a viable housing alternative for the low-income group in the developing nations. However the concept have also been applied in housing provision for the middle-income group in the developed countries mostly for house improvement rather than for building new ones (Carmon and Gavrieli, 1993). Another term is 'Self-build', that is a user participation approach used by the middle-income group to provide a better quality homes (Ward, 1982). In this concept the user are taking the role of developer or contractor, or even to build themselves on new or half-finished house units. 'Self-provided housing', the term used by Clapham (1993) on the other hand is for individuals or groups who managed the provisions or modifications of their homes, especially detached family houses.

From the study on alteration works in the urban housing schemes, it is found that users were involved in the design and also the construction process of the alteration, ranging from consulting architects/designers, material procurement, selection and appointment of contractors, managing payments, supervising construction works, and some of the users also involved in the construction of the houses. However, it is noticed that user participation in the design process of the alterations were not optimised. In many cases design participation were only in the form of describing to the designers or the contractors their requirements. Very few of the users commented on the drawing provided by the designers. Some of them did not even know what have been drawn by the designers. Despite the minimum user involvement in the design process, most of them were satisfied, and even exited with the outcomes of their personalized houses.

4.2.1 User participation methods for personalization   The application of the widely accepted professional-led participation approach may be suggested for housing unit's personalization in urban mass housing. However some modifications will need to be introduced to ensure it's viability in Malaysian context.

(i) Co-decision approach.
It is recommended to let the users involve in the design of the housing schemes, as has been practiced in the develop countries, such as Millgate, Newark in Nottinghamshire, United Kingdom (Moughtin et.al

1999, page 107-122). However there are several technical, cultural, and bureaucratic problems to consider before the approach can be viably applied. Ahmed (2003) highlighted from several authors that getting user representation is extremely difficult, particularly in large-scale housing projects. Wide gaps between the professionals and the users has led the professional's preconceive ideas to dominate the decision-making. Bureaucracy and developer's management strategies also influence the decision making process and some other user participation models that were implemented, experiences several shortcomings.

(ii) Passive participation using statistical and UVHAR surveys.

The approach allows the configuration of the urban spaces with regards to housing layout and the design of the house units, being controlled by the professionals. User participation may be in the form of statistical surveys and UVHAR interviews from the potential/actual users. The information may be fed into the design process. The neighborhood character or identity building of the housing schemes may be developed by the professionals by using, for example, regionalism participation approach. In this approach, active user participations may be introduced in the design of the individual house units (not the overall layouts). This may be done by providing various personalizable alternatives of housing units for the users to choose.

(iii) Programmed user participation

It is suggested that user full participation starts when the houses are handed over to them. Therefore, appropriate personalization programmes are needed for the users to carry out personalization works according to their financial capacity, income, and time scheduling. Options should be as flexible as possible where it should allows options, ranging from the users as a developer or designer to the users constructing the building themselves. Two main options to be considered are *Developer Assisted Personalization Programme (DAPP). and Post-Occupancy User Managed Personalization Programme (POUMPP).*

Developer Assisted Personalization Programme (DAPP) integrates the personalization process as part of the formal housing production. In this case the production process will be divided into two main stages. Stage one is for the developers to produce the Personalizable housing unit prototype (PHUP) where passive participation would be appropriate. Stage two is where the actual users will be involved in personalizing their houses. The developer will be providing assistance in terms of design ideas, time schedules, and construction work force. The advantage of this option would be for the developers to benefit from a complete package of housing provisions. Also the personalization programmes may be tailor suited to developers' provision programmes. For the users, the process will be more systematic and timely. Personalization works would be more efficient because they are carried out by the agencies that are familiar with the original units. The disadvantages would be that this programme may not be able to facilitate self-help concept, long term personalization programmes, low-income users who wish to personalize according to their income streams, and users who wish to erect the building themselves. This programme has some similarities with the concept of 'customization' that has been practiced by housing developers in the United Kingdom (Barlow 1999). The developers allow users to customise their house design during the construction process of their houses, as part of sales attraction. Developers allow users' input in various techniques and scales. Some allows users' inputs on the external facades and some of the non-load bearing walls. Many are limited only to customisations of fixtures and fittings. Some other large-scale housing developers are reluctant to allow customisation for some other practical reasons such as difficulties in time allocations and so on.

Post-Occupancy User Managed Personalization Programme (POUMPP) is where developers' housing provision programmes end when the PHUP are handed over to the users. The users will have more freedom in carrying out the personalization works according to their time and income streams. Users who are interested in the self-help approach are accommodated for. Another significant advantage is for national interest, in which new jobs may be created. The programme may be monitored by the related government housing agencies, and offer the programmes to practitioners (designers, contractors, suppliers etc) who may be interested to specialise in personalization programmes. However, all practitioners will have to undergo proper personalization trainings before licensed to carry out the works. Special training programmes must also be provided for the users particularly from the low-income group who are interested to build their houses themselves.

4.3 Personalizable House Design

Architects must avoid treating house design as finish items, instead they must realize that they are providing means for other 'designers' to explore. Therefore, the houses design that the architects produced must be flexible, open-ended and modifiable (FOM). For mass housing schemes where standardisation is inevitable the following design considerations are suggested: -

(i) Avoid the rigid standardised, and predetermined housing unit design that do not take into consideration future modifications, as is commonly done. But planning regulation must be observed to ensure the environmental unity or the neighbourhood characters are not adversely affected.

(ii) Identify which part of the structure are fixed or changeable

(iii) Plot sizing, house shape and layout shall support personalization. Davidson and Payne (1983) suggest that rectangular shape building in terrace house with 12 meters façade is considered as the most flexible unit. 6 meters width façade is the minimum dimensions for being flexible.

(iv) Consider developing a "FOM core design" strategy that have the same basic principle with the widely used core house concept. The core should be designed by taking into consideration the personalization patterns that will take place later. The core design may have two options namely *extendable core design* (Fig.2), and *open plan house design* (Fig.3).
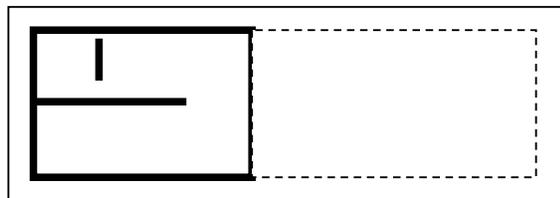

Fig.2 Extendable core design

In extendable core design, the houses are designed with possible modes of future extension where the design will be started with a basic set of housing attributes. The design may be in modular form, meaning that extension will also be in modular pattern. The main advantage is the optimum flexibility for extensions and modification of the interior or exterior parts of the houses. This option may pose difficulties in monitoring the façade design hence the environmental unity (neighbourhood character) of the locality. This may be overcome by designing a proper mode of extension, standardised construction technologies and a proper personalization programmes. It means that the extensions are not left to the users entirely.
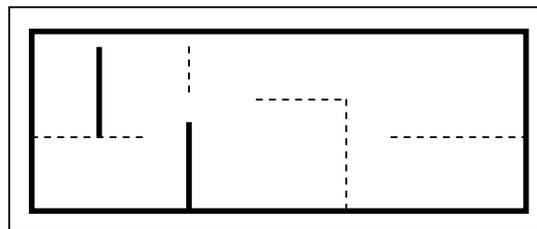

Fig.3 Open plan house

The concept of open plan office is borrowed in the open plan house design concept (Fig.3). Wu (1999) proposed a similar house design concept in China by using a structural system that relies on long span panels. In each unit only the kitchen and the bathroom are fixed. No wall has been constructed between the kitchen and the service balcony in order to give residents flexibility in its use. In the context of Malaysian urban mass housing, The housing unit will be designed as a box, providing the basic attributes and leaving the interior layout open for personalization. The main advantage of this option is the ease of control of the façade design thus ensures environmental unity. Illegal extensions

practices may also be minimised. However, appropriate construction techniques must be developed, together with proper programmes.

An important flexibility issue is enlargement of houses' size. Currently, the extensions are taking place on the empty space where the building lines have not reach the development limits. There are some users in the study area, extended their houses vertically by occupying the attic areas, without increasing the original height of the building. In this way they managed to get more spaces compared to the horizontal expansion. However this practice is illegal.

5. Construction Technology

The construction technology for personalizable housing prototypes must support the design and user participation approach. The techniques have yet to be explored. Some of the existing techniques may be considered for their potentials and suitability. Skeletal structure such as reinforced concrete frames offers modification flexibility to certain degree, due to the nature of the wall being non-load bearing. Load bearing structures (brickwork and blockwork) have the advantage of being a dry construction, but the application is unpopular and the know-how of this technology is lacking in this country. Also, the use of too many structural walls will make modification more difficult. Concrete panel construction that is commonly used in the prefabricated housing schemes on the other hand is too rigid for alteration. Currently, most of the conventional construction techniques are still expensive and difficult for personalization. It is suggested that the construction techniques for personalizable housing units, should have the following attributes: -

(i)   The construction systems minimise demolition when the buildings are modified
(ii)   Building components have a high degree of moveability and reusability.
(iii)   Minimum structural walls
(iv)   Minimum wet construction
(v)   Building components/materials are small in size, lightweight, easy to handle and transport.
(vi)   High degree of standardization.
(vii)   Modular coordinated construction system.
(viii) Using locally available components and materials.
(ix)   'Easy to fit' jointing systems

One of the interesting construction systems to be explored is the use of demountable partitions concepts, using materials with properties suitable for privacy. The 'lego' concept is a highly flexible systems and a potential concept in the personalizable housing unit prototype, because of the 'inter-locking' jointing systems, using small size units, dry construction, and lightweight.

6. Enabling strategies

Tipple (2000) expresses that government enabling strategies is vital in supporting personalization approaches. He posits that the first stage in enabling is to discover what drives and what hinders the personalization process. The "what drive" factors of personalization have been discussed earlier that can be summarised as a viable housing arm for a quality housing at affordable costs. What hinders the application of personalization framework is many. Government policies such as Planning and building regulations are indicated as major disabling or enabling factors. The current 'hindering' outcomes from the completed renovation works in the housing scheme that is being studied has several similarities as what was explained by Tipple (2000). Uncontrolled and unplanned transformation, unpredictable demographic and neighbourhood character, creating rooms without proper ventilation and lighting, crude construction system employed, unconformities to building regulations, encroaching outside boundaries, low-quality contractors employed, are some of the examples of planning and building control problems. Other hindering elements are the bureaucratic procedures including the time taken to process the applications for carrying out alteration works, building and planning requirements that are rigid. The requirements for architectural drawing to have "architect's signature" seems to be questionable. Many of the users found this as a mere formality but yet costly that lead to many did not bother to comment on the drawings.

There are so much that the government would gain from personalization practices. But it is of paramount importance to review government's housing approaches in order to allow the practical implementation of personalization. The currents planning and building regulations must be modified in order to allow extensions rather than to outlaw the practice, and thus leave them uncontrolled (Tipple 2000). Some of the enabling steps that promote and at the same time control the practice are suggested as follows: -

(i)   Allow flexibility in terms of room types, number, and size. If possible allow vertical extensions with some degree of control.

(ii) Relaxation of set-backs and building lines to allow development close to side and rear boundaries (Tipple 2000)

(iii) Introduction of classes of permitted development within which planning permission is not needed (Tipple 2000).

(iv) Introduction of classes of permitted developments that do not require professionals' involvement for approval.

(v)   Recognize *Personalization Programmes* (as discussed earlier) as part of housing development policy, so that the establishment of the programmes are to be controlled by the related government bodies.

Financial enabling strategies are vital to ensure viability of the framework. The study suggests that the users were able to manage the alteration works out of their family savings. Some managed to obtain financial helps from their Employees Providence Funds (EPF), and also loans from commercial banks. With the suggested personalization programmes, modifications to the current standard procedures in getting bank or government loans will have to be modified. For example, allow application for buying new houses together with personalization works in a single package. Users who personalize using their family savings sometimes faced difficulties of getting sufficient fund on time. This may delay the works on the contractors, thus the completion of the project. Bridging loans for contractors for personalization projects may be considered (Tipple 2000). In a systematic personalization works, the authors assume that the contractor may have several renovation projects in different locations. Allowing them for bridging loans would lead to a more efficient and timely completed works.

7. Conclusions

In conclusion, personalization is a viable housing provision arms for a better quality houses at affordable costs. It is a way to achieve sustainable living environments because the users are involved in the making of their living environments. This paper highlights the great potential of housing personalization approach to be systematically applied in the urban mass housing in this country. This is a new attempt in housing development that is different from the commonly known user-participated housing. This approach is applicable for the normally employed formal mode of housing delivery for the low and the higher income groups. The concept will benefits the government in providing a viable housing arm that saves unnecessary spending on housing. It may create more jobs by creating new areas that the professionals and builders may venture. The scheme would be more attractive to the potential housing consumers, hence the developers. However Government's recognition on this approach and commitment from all sectors of housing development are necessary before the system could be practiced.

The ideas presented in this paper are still conceptual and subjected to further elaborations and studies. The suggestions are based on observations from the authors' study on renovated houses in a housing scheme in Johor Bahru, using Means-End Chain (MEC) laddering techniques. It is not possible to provide any statistical data because the study is still at an early stage. It is strongly recommended that several researches on the design, construction technology, and enabling strategies to be carried out to ensure a viable personalization framework to be effectively implemented.

References

Ahmed (2003). *User-Controlled Housing Process: Towards Socio-culturally Responsive Low-Income Housing in Cairo, Egypt*. Ph.D Thesis. Welsh School of Architecture. Cardiff, University of Wales.

Barlow, J. (1999). *"From craft production to mass customization. Inovationrequirement for the UK housebuilding industry."* Housing Studies 14: 23-42.

Bhatt and Navarret (1991). "The Self Selection Process: A simulation exercise." *Open House International* 16(14): 10-19. Bechtel (1997). *Environment and Behavior. An Introduction*, Sage Publication, Inc.

Becker and Coniglio (1975). "*Environmental messages: Personalization and territory.*" Humanities 11: 55-74.

Bentley et. al (1985). *Responsive Environment: A manual for Designers*. London, UK, The Architectural Press Ltd.

Brierley (1993). *Design Theory in the context of the recent history of housing research.*

Carmon and Gavrieli (1987). "*Improving Housing by Conventional Versus Self Help Methods: Evidence From Israel.*" Urban Studies 24: 324-332.

Chua (1988). *"Adjusting religion's practices to different house forms in Singapore.*" Architecture and Behavior 14(1): 3-25.

Clapham, et al. (1993). "*Individual self-provision and the Scottish Housing System.*" Urban Studies 30(8): 1355-1369.

Coolen, H. and J. Hoekstra (2001). *"Values as determinants of preferences for housing attributes."* Journal of Housing and the built Environment 16: 285-306.

Davidson and Payne (1983). *Urban Projects manual. A guide to Preparing Upgrading and New Development projects Accessible to Low Income Groups.* Liverpool, Liverpool University Press in Association with Fairstead Press.

Duncan and Rowe (1993). "*Self provided housing: The first world hidden housing arm.*" Urban Studies 30(8): 1131-1354. Herskovits, M. J. (1948). *Man and his works.* New York, Knopf.

Hofstede, G. (1994). *"Management scientists are human.*" Manage Sci 40: 4-13.

Lang (1987). *Creating architectural theory: The role of the behavioral sciences in environmental design*. New York, Van Nostrand Reinhold Company.

Lee (2004). Sustainable housing - realistic goal, or fantasy? An evaluation of housing policies in Lithuania. *ENHR International Housing Conference, Cambridge University, UK.*

LeVine, R. A. (1984). Properties of culture: An ethnographic view. *Culture Theory: Essays on mind, self and emotion.* Sheweder and LeVine. Cambridge, Cambridge University Press.

Mahmud Mohd Jusan and Ahmad Bashri Sulaiman (2004). The application of Means-End Chain in evaluating Built Environment. *Passive Design Consideration in the Built Environment, International Islamic University Malaysia.*

Mahmud Mohd Jusan (2004). Exploring User value-house attributes relationship in the personalized houses in Malaysian mass urban housing: The application of Means-End Chain Framework. *The ENHR New Researchers Conference, Cambridge University, UK.*

Mahmud Mohd Jusan and Ahmad Bashri Sulaiman (2003). Sustainable Urban Living Environment: Personalization in Malaysian mass urban housing. *1st APHR Conference, Kuala Lumpur Malaysia.*

Moghtin, C., et al. (2000). *Urban Design: Method and Techniques*. Oxford, Architectural Press.

Priemus, H. (1986). "Housing as a social adaptation process: A conceptual scheme." <u>Environment and behavior</u> 18(1).

Rapoport (1982). *The meaning of the built environment. A nonverbal communication approach*. California, USA, Sage Publication, Inc.

Rapoport (2000). *Science, explanatory theory, and environment-behaviour studies.* Theoretical Perspective in Environment-Behavior research. Wapner et.al. New York, Kluwer Academic/Plenum publishers.

Rokeach, M. (1973). <u>The nature of human values</u>. New York, Free Press.

Sinai, I. (1998). *Housing Choice and Housing Uses in Kumasi, Ghana*, Univ. of North Carolina at Chapel Hill: Phd.Thesis.

Speare, A. J., et al. (1975). *Residential mobility, migration, and metropolitan change*. Cambridge, MA, Ballinger.

Tipple (2000). *Extending Themselves: User initiated transformations of government-built housing in developing countries.* Liverpool, UK, Liverpool University Press.

Turner, J. F. C. (1976). *Housing by People: Towards autonomy in building environments.* London, Marion Boyars.

United Nation ((1992)). *Agenda 21: Strengthening the role of Major Groups: 23:1.* http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter23.htm.

Ward, P. M. (1982). Introduction and Purpose. *Self Help Housing - A Critique.* Ward, Mansell Publishing Limited.

Wulz (1986). "*The Concept of Participation.*" Design Studies 7(3): 153-162.