Research Paper

Personalisation, Flexibility Components of Housing, the New Paradigm in Housing Development: A Panacea to Housing Deficit in Rivers State, Nigeria.

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ABSTRACT

There has been several debates on housing and its associated shorts falls. Around the world, housing is a challenge and individual nation sorts to ameliorate such challenges through research. Through these research there are shift in paradigm and its yielding results. This paper sorts in appraising key functional techniques that aided in solving housing problems such as personalization and flexibility concept. Personalisation is the process of owning a housing that meets an indvidual's choice while Flexibility allows adjustment in a housing structure to meet an individual's choice per time.

This paper analysed on the new paradigm in housing development by considering personalisation and flexibility of components in solving housing deficit in Rivers State.

The impact of personalization in meeting individual needs and how flexible housing components are in terms of its adaptive characteristics; the term flexibility as a new paradigm in housing development, definitions and framework of flexible housing, discussions on housing flexibility and recommendations towards avoiding possible setbacks in the system are all covered in different sections. This techniques when fully applied will aid in solving the housing challenges

KEYWORDS: *personalization, housing, flexibility, deficit*

I. INTRODUCTION

"Housing Preferences" and "Personalization" have become widespread and the needs for Individuation due to the recent increase in changes of lifestyle.

In result to this, house buyers are no longer interested in standard designs produced by the housing developers as emphasised by Zairul and Geraedts, (2015); Zairul, (2013); Zairul, (2015) and Zairul, and Rahinah, (2011).

Since it's not an all-inclusive model, it has basic shortfall. However, personalization has always been associated with extra cost and can potentially increase the housing price (Zairul and Geraedts, 2015; Zairul, 2013; Zairul, 2015 and Zairul, and Rahinah, 2011).

It is often difficult to physically adapt to shelter and modify the existing dwellings, this leads to many wastes and environmental burdens (ibid). Understandably, Individual spaces in the house may become obsolete at times due to the changes in users' needs.

Furthermore, the way we produce, the linear system that contains make-take-dispose consumption, had not changed since it started off an industrial revolution a long time ago. This resulted to scarcity, depletion and waste of resources, environmental pollution, and climate change. Current and future developments show that the demand for natural resources will increase three times in 2050 (ibid).

In this present housing situation, when the option to own a house is almost financially inaccessible for the first-time buyers, the regular renting contracts only allow little room for improvements and modifications (Zairul, 2013). Current physical housing scenarios caused marginal options for the customers to 'grow' and 'shrink' with the house and a better chance to fulfil their future spatial requirements (Zairul, 2015). This inflexibility of current housing has caused migration of the users towards other places to suit their new status.

As the function of housing changes from the provision of shelter to serving multiple functions, the house should be a product that has long time-span and has the flexibility to upgrade and downgrade. Each successive tenant undoubtedly makes changes to the unit to match their needs and requirements as their needs evolve over time. Therefore, a potential solution should allow the "flexibility" not only in term of the physical elements of the unit-envelope but also in terms of innovative leasing for the inhabitants.

1.1 STUDY AREA

Rivers State is used as a study area for this work, the state was created out of the old Eastern Region on May 27, 1967 with 18 Local Government Areas and its capital in Port Harcourt.The state covers a land area of 11,077 square kilometres and bordered by the Atlantic Ocean at the south, to the north by Anambra, Imo and Abia States, at the east by Akwa Ibom state and to the west are Bayelsa and Delta States (Kari, 2019).

The state contributes to more than 40% of the crude oil and food production in the country, this lead to the state being called the 'Treasure Base of the Nation'. In addition, there are two major refineries and seaports in Rivers state, with various industries spread across it (Otto & Ukpere, 2014). Its capital as Port Harcourt a cosmopolitan city is the second largest commercial centre in Nigeria.

1.2 STATEMENT OF STUDY PROBLEM

Housing provision in Nigeria has been bedevilled by several challenges over the years. According to Okpoechi, (2014) these challenges have been quantitative as well as qualitative.

Quantitative challenges manifest in housing deficits, which have persisted since independence. Housing deficit in Nigeria was estimated at 18 million units in 2008. This is expected to remain on the ascendancy, as provision of new housing units, has not been commensurate with natural population growth estimated at 3.2% per annum, nor with the unabated spate of urbanisation in the country.

Okpoechi, (2014) Posit that the quality of housing when provided is another issue of concern in public provision of housing in Nigeria. Housing schemes in Nigeria have been described as being poor in terms of design, quality, and desired functions. The recurring poor quality of housing schemes have been attributed to absence of a clear knowledge of the characteristics, needs, and preferences of the target consumers (Okpoechi, 2014; Ibem, Anosike, and Azuh, 2011; Olotuah, 1997; Adriaanse, 2007; Kellekci and Berkoz, 2006; Ibem, and Amole, 2010; Ayedun, and Oluwatobi, 2011; Diogu, 2002; Ukoha, and Beamish, 1996 and Jiboye, 2009). These often lead to development of housing schemes that are not context specific, and therefore unable to give satisfaction to residents.

The satisfaction of residents with their housing has been widely used as an indicator of housing quality. A critical aspect of housing quality is the design quality of the housing (Okpoechi, 2014), as it has been known to change the value of residential layouts.

Housing design in this context is a holistic process, involving both the design of the individual units, and the design of housing layouts. For there to be a sustainable improvement in housing delivery in Nigeria, the individual housing units must not be designed in isolation of the overall housing layout.

Okpoechi, (2014) emphasised that the design process in this case would have to holistically address the concept of housing as a system, which includes a protected place for dwelling, a safe place for social expression, and an avenue for communal interaction.

To achieve this, the mean functional housing design needs must be ascertained for each group for which the housing scheme is targeted. Furthermore, before the housing scheme is designed, there should be room for inclusion of the end user during planning. Essential information about their need, payment plan will as well form the basis for the design, one of the information is tied to resources, what is their income level.

For this study the business model of existing housing scheme with clear policies is appraised.

II. FLEXIBILITY: THE NEW PARADIGM

Historically, the term flexibility was coined in Netherlands since the 1980s due to changes in social household's structure and lifestyles. Flexibility also denotes the ability to change the floor plans for future needs. These changes involved leaving openings in the concrete wall to allow for additional rooms either by adding or removing walls (Zairul and Geraedts, 2015; Zairul, 2013; Zairul, 2015 and Zairul, and Rahinah, 2011).

The concept attempt to distinguish flexible housing into two levels which are the "support" and the "infill" levels. The support level is defined as something that is non-removable while the infill level is

something removable and easily configured (Zairul and Geraedts, 2015; Zairul, 2013; Zairul, 2015 and Zairul, and Rahinah, 2011). The user's ability to combine both elements can create real solutions and accommodate flexibility according to changes in needs and desires.

Zairul and Geraedts, (2015) developed a theory that the combination of standardisation and personalization elements in housing can create added value towards the housing industry.

In a survey conducted in Hong Kong, to overcome the price and economic factor of the fancy design, both public and private developer opted for a standardised layout (Zairul and Geraedts, 2015; Zairul, 2013; Zairul, 2015 and Zairul, and Rahinah, 2011).

However, Zairul and Geraedts, (2015) posit that the standard layout prepared by the housing developers has caused more problems and are unable to satisfy the different needs of occupants or the house buyers. They also noticed that the tenants will end up making renovations to their units after they got their house keys.

These additional modifications have caused wastages of valuable resources, materials, energy, time and especially money and manpower. However, the industrialised housing can help to reduce these problems by allowing individual configurations of the layout to suits individual requirements.

In Japan, customers are given choices over the personalization of housing types, floor plans, exterior and interior elements as well as finishings and fittings.

The option for personalization has become popular recently especially in emerging countries (ibid). The flexible housing should also have the potential to incorporate new technologies over time and the flexibility to adjust to change in demographics. The flexibility of the housing system should also allow for a complete shift in the use of the building from housing to another function. Flexibility also permits the potential for relocation from one place to another.

It was argued that several problems may stall personalization of housing which include:

- Concern of unsold customised house by third party.
- Concern for the future value of the property.
- Restrictions by the long development times.
- Restrictions on building regulations and planning controls.
- Unknown construction cost (Nicol & Hooper, 1999).

The study that support housing personalisation in the literature is abundant. For example, modular homes, factory manufactured, timber IBS, drywall partition and many more (Zairul and Rahinah, 2011). Therefore, the focus of the study is on flexible homes that are modular and flexible in term of configuration.

III. DEFINITIONS OF FLEXIBLE HOUSING

Zairul and Geraedts, (2015) defined the flexible design in housing as something that, allows the possibility of changing layout according to owner's preferences, from potential to incorporate new technology, to adjust to occupancy numbers, to alter the use of the building to something else or adaptable use. Here, we add another feature that the flexible housing should also be able to relocate to other locations by the possibility of 'adding' and 'removing' the components and adapt to the changes in the needs of users per time.

Another definition of flexibility housing describes the flexibility of the structure to be adaptable according to the user's needs (Zairul and Geraedts, 2015)). Flexibility also means it should be responsive towards the environment and users.

Recently, advancing from the established foundation of "Open Building" group, (ibid) outlined some of the charateriatics depicted from the 'agile architecture.' The model of agile and adaptable explores three categories as a stimulating mechanism; spatial flexibility, Functional flexibility and Aesthetic flexibility. The model also promotes that practicing of the open building and flexible design increases the high technical and technology that advanced technology and professional teams can support.

In other perspectives, flexibility is defined as being responsive and adaptable. However, we argue that the definition of flexible is solely under the purview of the user's satisfaction. Therefore, there must also require some restrictions.

Summarily, flexible housing is a scheme that can adapt to the changing needs of users. Flexibility gives option and possibility of choosing different housing layout prior to the existing need as well as the ability to adjust to future needs.

Furthermore, the definition of involves the following equilibrium; towards the users, the design and the structure.

The concept of flexibility towards the users are the choices that the flexibility design in housing offers towards them. Secondly, the design gives the flexibility of choosing different types of design and accessory for the aesthetic reason. Thirdly, the structure, displays its flexibility through an advance mechanism that will utilise

the technology. The flexibility of the structure is supported by the advancements in knowledge and sophisticated techniques (Zairul and Geraedts, 2015; Zairul, 2013; Zairul, 2015 and Zairul, and Rahinah, 2011).

3.1 ADAPTIVE CAPACITY OF FLEXIBILITY
The need for flexibility in the building/housing is motivated by its adaptive capacity as characterised below:

3.1.1 ORGANIZATIONAL FLEXIBILITY
This is the ability of an organization or user to respond adequately to changing demands of the built environment.

3.1.2 PROCESS FLEXIBILITY
This is the capacity to react to changing circumstances, wishes or demands during the initiative, the design and the construction phase.

3.1.3 PRODUCT FLEXIBILITY
This is the ability of a building (the product) to respond to changing circumstances, wishes or demands during the use phase of the building. During the usage of buildings, the translation of demand into transformation and use dynamics on three different levels: location, building and unit.

1. USE DYNAMICS
This allows the users to formulate the demands. The building must be flexible to change with time with these (changing) needs.

2. TRANSFORMATION DYNAMICS
This concerns the requirements for a building that should be able to accommodate an entirely different user group or various functions shortly. This dynamic leads to specific demands for rearranging the spaces for various user groups within a framework.

The flexibility of a supply is translated into three spatial/functional and construction/technical characteristics. They determine if a building can meet the requirements, In this contest:
1. Rearrange flexibility **deals with location and unit of home who bears certain question,** to which degree the location, the building or the unit can be rearranged or redesigned.
2. Extension flexibility**; ensures to understand the level and asks certain question.** To which degree the area, the building or the unit can be extended.
3. Rejection flexibility in this note opposes the notion with a question to understand the level of rejection. Hence, asks to which degree (part of) the area, the building or the component can be rejected (Zairul and Geraedts, 2015; Zairul, 2013; Zairul, 2015 and Zairul, and Rahinah, 2011).

IV. FRAMEWORK FOR FLEXIBLE HOUSING

In order to get into the discussion, it becomes imperative to understand how the flexible housing helps to provide affordable housing. It's a common notion that the flexible housing needs support from many attributes, especially in the production field.

The flexible terms connote the idea of prefabrication, installation rather than construction, easy delivery and concern on the customer's requirements. Here, the essence is to establish a link between existing theories in the respected fields and presuppose the history and current canon of the attributes; every departure from conventional understandings must be explained and justified.

Various researchers have assured that producing a more customer economic-centric has become a priority in many industries (Zairul and Geraedts, 2015; Zairul, 2013; Zairul, 2015 and Zairul, and Rahinah, 2011).

There is equally a school of thought that believes that a house is the biggest investment in one's life. It is a place for socialising, gathering and bonding activities among the family members. It is also an investment in physical, psychological, social and financial (Zairul and Geraedts, 2015; Zairul, 2013; Zairul, 2015 and Zairul, and Rahinah, 2011). Hence, it is necessary the house is built according to the need of the end users.

The concept of customer satisfaction has been developed in the service industry. Scholars also in the service industry has shown that there is a high correlation between customer satisfaction and intention of returning to the same service provider. Moreover, that satisfied customers' brand loyalty has positive impacts on business (Zairul and Geraedts, 2015; Zairul, 2013; Zairul, 2015 and Zairul, and Rahinah, 2011)

V. DISCUSSION

Following the debate by Okpoechi (2014), that the housing challenge is Nigeria has two outstanding variables; the quantitative and qualitative. It's noteworthy to leverage on claims from other scholars regarding the position of this housing menace. But the big question is "how long do we dwell in this crisis, hence, it

became imperative to understand the true nature and proffer an ameliorating solution. As one of the solutions, it's almost obsolete to wear potential house buyer with the status quo as well as consideration and strategies that falls shorts of their desires and aspirations, hence, a new paradigm has been developed globally. Leveraging on such global paradigm to mitigate the re-occurring Nigerian housing menace becomes a necessity. Accordingly, one of the standard in the current housing industry, is that there is a considerable length of time between customer-supplier interactions making customer's brand loyalty weaker in the building industry. In another development, the location of the housing units becomes very significant as it has direct impact on the purchase-ability of the home. Individual homes located approximately on a good neighbourhoods has a way of attracting home owners and intended investors/buyers. Thus restricting interested individual to remain loyal to the same housing company or otherwise.

The opportunity to enhance customer satisfaction and increase market has become more popular lately. It is against the conventional system where the housing developers purchase a plot of land and build a standard design. The housing customers nowadays know their rights and thus demands a unique style that reflects their lifestyle.

Another useful concept to be adopted is the concept of personalisation; this is believed to be amongst the answer to address customer's satisfaction. Personalization as stated above can be defined as changing or allocating product and services according to the client's needs and requirements (Zairul and Geraedts, 2015; Zairul, 2013; Zairul, 2015 and Zairul, and Rahinah, 2011).

In that vein, Zairul and Geraedts, 2015 equally adds that recent studies highlighted that the prefabrication of housing was considered as a process of mass customisation and stressed that market demands can only be addressed if the housing industry adopted the industrialised and appropriate manufacturing concept as a quick fix to the clients' needs unlike the status quo. Where housing were done according to the designers and developers, neglecting the role of the end user. Furthermore, it is also noteworthy that there are also few associated challenges, if the house assumed total customisation; in term of client access to design, this would require the housing supply to be changed radically. Hence, Zairul and Geraedts, (2015) mentioned that there are limits to the application of such strategies in the case of house-building products, especially if the products are highly customised. Therefore, as suggested by (ibid), this makes the concept of flexibility not necessary freedom of choice but also making a choice out of given options (Adriaanse, 2007).

VI. RECOMMENDATIONS

Flexibility in housing is basically not freedom of choice to customers therefore, in order to strengthen the system these recommendations can be put in place:

- Options of choice in considerations of Individual specific needs
- Affordable costing and taste of housing unit for different levels of income earners
- Establish government policy
- Per time flexibility in housing should allow conversions from residential to commercial or organisational still retaining the critical components of the structure.
- Considerations on choice locations used for housing

VII. CONCLUSION

To a large extent, housing deficit is tilting to be solved using personalisation and flexibility. However, there is still a lot to be done to give it a boast; it should be fully backed by the government or supported by functional government policies and matching enforcement strategies in order to factor the individual critical needs.

In this paper, it was ascertained that in personalisation customers knows their rights to own or live in housing that satisfies their unique styles and lifestyle per time but there should also be a balance in flexibility of components in housing between the individual choices in housing and the proposed architectural design.

REFERENCES

[1]. Ademiluyi, A., 2010. Public Housing Delivery Strategies in Nigeria: A Historical Perspective of Policies and Programmes. Journal of Sustainable Development in Africa, 12, 6, 153-   161.
[2]. Adriaanse, M., 2007. Measuring residential satisfaction: A residential environmental satisfaction scale RESS, Journal of Housing and the Built Environment, 22, 287-304.
[3]. Akinmoladun, I. and Oluwoye, J., 2007. An Assessment of Why the Problems of Housing   Shortages   Persist   in   Developing Countries: A case of Study of Lagos Metropolis, Nigeria Pakistan Journal of Social Science 4,4, 589-598.
[4]. City of London (COL), 2013. Business Model Development for a Housing Development   Corporation for the City of London: Interim Report, City of London Proposed Housing Development Corporation, 1-39.
[5]. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), *GmbH,* 2016. Inclusive   Business   Action   Network,   Federal Ministry for Economic   Cooperation and Development (BMZ), Abuja, Nigeria.
[6]. Diogu J. O., 2002. Housing the poor in Nigeria: The integrated project approach, AARCHES Journal, 2, 1, 40-44.

[7]. Etim, E., Atser, J., and Akpabio, F., 2007. The new social housing scheme in Nigeria: How beneficial for the Less privileged? African Journal Online: Global journal of social sciences, 6, 1, 1-6.

[8]. Ibem, O., Anosike, N., Azuh, E., 2011. Challenges in public housing provision in the post-independence era in Nigeria, International Journal of Human Sciences, 8(2), 421-443.

[9]. Ibem, E. O., and Amole, O. O., 2010. Evaluation of public housing programmes in Nigeria: A theoretical and conceptual approach, The Built Environment Review, 3, 88-116.

[10]. Jiboye, D., 2009. Evaluating tenants' satisfaction with public housing in Lagos, Nigeria, Town planning and Architecture, 33, 4, 239-247.

[11]. Kellekci, O. L., and Berkoz, L., 2006. Mass housing: User satisfaction in housing in housing and its environment in Istanbul, Turkey, European Journal of Housing Policy, 6, 1, 77-99.

[12]. Olotuah, O. and Bobadoye, A., 2009. Sustainable Housing Provision for the Urban Poor: A Review of Public Sector Intervention in Nigeria. The Built & Human Environment Review, 2, 51-63.

[13]. Olotuah, O., 2010. Housing Development and Environmental Degeneration in Nigeria. The Built & Human Environment Review. 3, 42-48.

[14]. Olotuah, O., 1997. "The house: accessibility and development – a critical evaluation of the Nigerian situation". Proceedings of National Symposia on Housing in Nigeria, Obafemi Awolowo University Ile-Ife, 312 – 317.

[15]. Okpoechi, C., 2014. Middle-income Housing in Nigeria: Determining Important

a. Functional Requirements for Mass Housing Design, *Architecture Research*, 4, 1A, 9-14.

[16]. Port Harcourt, capital of Rivers State; (undated). Overview of Rivers State, Port Harcourt. INTERNT: www.riversstate.net.ng/overview/, accessed 08/08/2018, 10:44pm.

[17]. Shackleton, M., Hebinck, P., Kaoma, H., Chishaleshale, M., Chinyimba, A., Shackleton, E., Gambiza, J. and Gumbo, D. 2014. Low-cost housing development in South Africa miss the opportunities for household level urban greening. Land Use Policy, 36, 500-509.

[18]. Ukoha, M. and Beamish, O., 1996. Predictors of housing satisfaction in Abuja, Nigeria. Housing and Society, 23, 3, 26-46.

[19]. Zairul, M. and Geraedts, R., 2015. New business model of flexible housing and circular economy, Research Collection, ETH Library, eth zuric, 1-16.

[20]. Zairul, M., 2013. Housing dilemma among young starters in Malaysia. Zairul, M., 2015. New industrialised housing model for young starters in Malaysia: Identifying problems for the formulation of a new business model for the housing Industry. Paper presented at the APNHR 2015: Asia-Pacific Network Housing Research Conference, Gwangju, Korea, 9-12 April 2015.

[21]. Zairul, N., and Rahinah, I., (2011). Identifying concurrent engineering (CE) elements for mass housing industry, Journal of Advanced Manufacturing Technology, 5, 1, 61-78.