ISSN 2250-3153

User Refinements in Architectural Space

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Abstract- Researches and designs of the information age are channelizing towards User-Experience design (UXD or UED), which has been developed in such a way as to give the impression that the design is unique to the user. Though it has successfully achieved its intent in certain design circles, questions arise in the field of architecture, concerning the relationship between the architect and the end-user recipient.

The society recognizes 'architects' as the absolute masters of space determination, design, building planning and construction supervision. The architect is imposed of certain authority and responsibility considering that he is a trained professional in space formation. Despite achieving the feeling of belonging to the user, many individuals will still make adjustments to the architect's design. How is the space formation being incomplete here? Is it because many users end up accepting, unconditionally, the architect's creativity and adapt themselves to their four walls or do they complete, themselves, the nuances of functionality and space formation?

This paper analyses the gap between the architect and the end-user as well as between the architect and his creation; to find out a better concept in which the user is given a higher power in designing than being a mere client.

Index Terms- improvisation, refinement, space, user, user experience architect

I. INTRODUCTION

The term, 'User Experience Architect', coined by Donald Norman, an academic in the field of Cognitive Science, gains much more importance in the present day. Understanding a user and his or her behavior is a vital component, and the active participation of the user in the initial stages of design plays a key role in User-Experience design (UXD). Through UXD, the architects are restrained from imposing their own values on the experience of the user. Though, this cognitive content is being widely accepted in the field of design, even in architecture, a gap is formed between the architect and the end- user over a period of time when the user realizes the change in his present immediate requisites and needs. This realization leads the users for subtle changes in their existing characteristics or qualities which, in turn, could be a change in the design language the architect had envisioned before. This is the 'refinement' which the user takes up over a period of time. This refinement is generally born out of the user's specific needs which changes over the period of time. An architect has only less or no role in this refinement.

II. RELATIONSHIP BETWEEN ARCHITECTS AND USERS

Bruce Allsopp, in his book Towards a Human Architecture, points out the notion of architecture which is currently prevailing in the industry.

"Architecture is not for architects; it is for people and whatever architects may think and whatever theories may they have, it is through the senses that people appreciate, that people feel architecture. What is required of the architect is a mainly intellectual process based upon sympathy. He must contrive to give to people what they will enjoy, not what he would wish them to enjoy because it is what he wants to do."

(Allsopp, Bruce; 1974:3)

With the ever-growing number of projects in the construction industry, the architect is involved with new clients, teams and people every now and then. A new relationship is made with each new client and this relationship lasts only as long as till the project finishes. Thus the communication between the architect and the user is short-lived. The architects spend only enough time with their clients and thus fail to put forward a design solution which satisfies the varying changes of the requirements of the user which happen over a period of time.

III. USER AND HIS NEEDS

The one who employs a particular function to the design is the 'user' of that space. There are different types of users, each one having individuality in their character, roles and reaction to their environing space. Two separate streams of user characters can be considered, namely, direct users and indirect users. Clients who are the users and have an immediate relation with the architect could be considered as direct users, whereas, the users who are involved in refining or modification of the space which was developed by the client, who is a speculative developer of generic spaces, comes under the categorization of indirect users.

Figure 1: Direct User

Figure 2: Indirect User
Source: Author

Each user has his specific needs, which will change over the course of time. The changes might take place slow but this calls in for a refinement in the space the user is dealing with. This refinement adds to the delight and gives an additional value to the architecture of the building. More the refinement happening, more the building turns into a user-tailored environment which would share the individuality of that particular user.

IV. CONTRIBUTION OF ARCHITECTS AND USERS

Architects and the users have a certain individual contribution to the space formation. While, architects are considered and given authority as the chief designer of space, they have only an ephemeral relation with their clients, that is, till the execution of the project and therefore the ethical contribution to the design or the unique added design value submitted to the user is also restricted from the architect's side. This happens mainly because the current architectural practice is a project-oriented based instead of a process-oriented methodology since the industry is constantly engaged in projects right after projects. The users, on the other hand, who are the prime exploiters of the design, are unaware of the design solutions the architect proposes and have to rely on him completely. They can't objectively challenge the design. Thus the users and their space specifications are often left out in the design stage itself and the prime focus shifts to aesthetics and form.

The objective of the architect, here, should be to give high priority to the users' requirements, now and later, and attempt to conclude a design solution which would adhere to the users' specific needs rather than setting up a methodology where getting the buildings built is considered to be a success.

V. THE CURRENT NATURE OF ARCHITECTURE

The on-going project becomes the core since the architectural industry mainly follows a project-oriented methodology, where the idea of celerity plays an important role. The character of the industry itself has taken a dramatic role with ever-changing, ever-growing projects, involving new clients and teams. This instigated an ephemeral relation between the architect and the client. An ethical breach was created between them and because of that, neither can an architect really give a design solution which would serve the client to his specific needs nor is he able to keep track of these user needs, that which would vary over a period of time.

[Post-occupancy evaluations (POE) had emerged in the United States during early 1970s, as a method to analyze efficiency and building performance but architects never became interested in it. However, POE does not adequately incorporate detailed properties of spaces, users and their activities and therefore keeping track of the utilization is not possible.]

VI. BRIDGING THE GAP

The present day project-driven architectural industry has left a gap between the users and the architects. A new approach or a new method is needed in order to bridge this gap. The architect has to follow a process-based approach where he generates knowledge about the powerful relation between the user and his special space configuration as well as his social behaviors and let that knowledge influences the future design aspects and overall outcomes.

By saying, 'bridging the gap', it is to be realized that, in architecture, being an imperfect art, refinement is to be given a significant importance in design approaches and that neither does the design process nor the obligation of architects to his users ever ends.

Different concepts have been put forward by many architects and philosophers based on the idea of improvisation of a particular space and many methods have been formulated to incorporate the users and their changing needs.

A. Evidence-Based Design – A New Approach

The Bartlett School of Graduate Studies at University College London (UCL) and Spacelab Architects have collaborated on a project on 'Effective Workplaces', an evidence-based approach, to develop a new professional culture, which integrates user in the design process. This idea is based on a probe related to the spaces, cultures, social and private behaviors and patterns of space usage of a user or organization and the knowledge developed out of this investigation is put into design solutions which would eventually conform to users' specific characters and varying needs.

Integration of research methods like Space Syntax, Social network analysis, questionnaires, ethnographic space observation, case studies on life projects etc. into the design process, a new approach, based on evidences, is formed and new relationships between the architect, user and also the design process is created as shown in Figure 3.

B. Concept of Slow Architecture

"Lack of time during the 'creative phase' of design and building harms not just the architecture but also impoverishes the 'experience time' of the user. If the building has not been built up slowly, layered in thought and craft, it lacks weight and denies the ability to mark time, to deepen experience. Pallasmaa writes that 'architecture must acknowledge and respond to the ... archaic dimensions of the human psyche'-it must slow down perhaps."

(Excerpt from Slow Architecture – An Overview; O Brien, Brian)

The concept of Slow Architecture explains the new approach to design process, where the design is born slowly after an intimate exploration of the site and patiently understanding the users and construction is brought down to the pace of human skill.

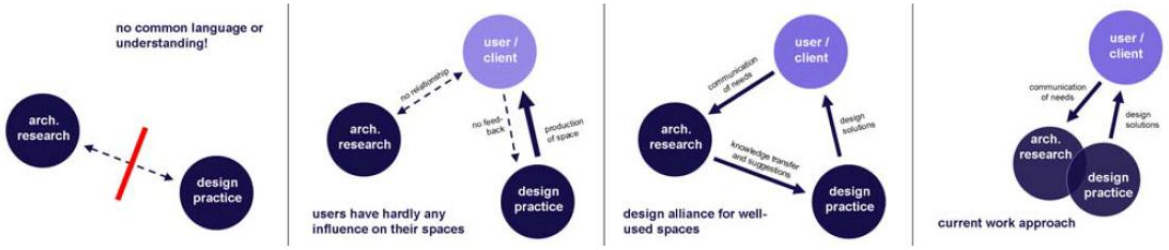

Figure 3: The formation of relationships between architectural research, design practice and the user.
Source: Changing the Architecture Profession – Evidence-Based Design, the New Role of the User and a Process-Based Approach; Authors: Kerstin Sailer, Andrew Budgen, Nathan Lonsdale and Alan Penn (2007)

The Japanese understanding of Wabi Sabi, the art of savouring the beauty of things in progress which are imperfect and incomplete, intimates how slowness is related to beauty.

Slow Architecture states that the passage of time, which would allow repetition, refinement and experiences, does not decay the architecture, instead, adds a unique sense of delight to it. Slowness gives the users opportunity and time to respond to their environment, appreciating the very details and the character of the space and develop a harmonious relationship with the building. The desire for reinvent and refinement at the appropriate pace of change develops an evolution rather than a revolution. Antonio Gaudi's La Sagrada Familia, which is still under construction, is probably the epitome of slow architecture.

C. Post Occupancy Evaluation

Post –Occupancy Evaluation (POE) is a systematic method where all the users are considered and their requirements and all the other aspects related to the building and its use are studied. The study gives a new perspective from the users' side which would help to overlook the other aspects rather than the aesthetics and architecture of the building. POE gives an extended hand in finding out how far the planning has been successful in a particular setting with respect to its users. This is very relevant in the case of old age users since their capacity to adapt to a specific setting is very limited. With some modifications to the methodology, this process could be adopted.

D. Concept of Space-Use Analysis

Space-use analysis is a logical frame work which gathers, represent and use the knowledge about users to calculate the space requirements of the users as well as their activities. Three different perspectives of space-use are taken into consideration for space-use analysis: (1) space perspective; the area available (2) user perspective; can all the users satisfy their needs? (3) activity perspective; is the area enough to do all the activities? These three perspectives are inter-related and change in one induces a change in the other two as shown in Figure 4.

Through space-use analysis, it is possible to simulate user's occupancy in a given environment and the activities, their spatial requirements and utilization could be computed to get a better understanding of the relation between the user and his space.

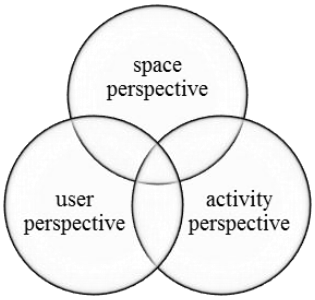

Figure 4: Diagram showing the inter-relation between the various perspectives of space-uses
Source: Author

Equipment is another physical entity which has an important role in space-use analysis. It accommodates the user-activities over a limited area, say, within a room. There could be multiple units of equipment within the same space but the whole space need not be active at the same time.

The flowchart below shows how various aspects like the user-activities and the spatial requirements lead to an action and how to compute and evaluate the utilization when it is related

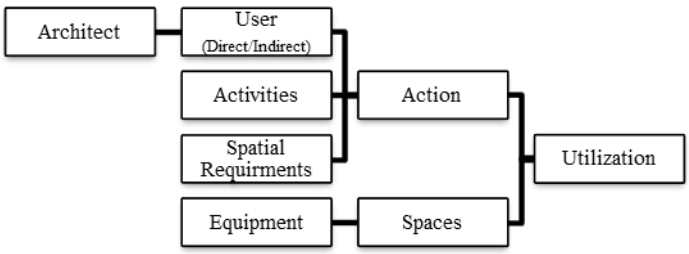

Figure 5: The relationship between user, activities and equipment
Source: Author

with the space required for the equipment.

VII. CASE STUDIES THROUGH SAMPLE SURVEY

A questionnaire-based Sample Survey was conducted during October 2012 to study the different patterns of space-use by different individuals across the world. It has been found from the survey that user refinements do happen without the intervention of architects. The findings of the survey are converted into a tabular form as shown in Table 1(A) and Table 1(B).

Table 1(A): Findings of the Sample Survey conducted during October 2012
Source: Data from Survey

RESIDENTIAL

SL No.	QUESTIONS	USER 1	USER 2	USER 3	USER 4	USER 5
1	CITY:	Trivandrum	Naperville (Chicago, USA)	Austin (Texas, USA)	Irinjalakuda (Trichur, Kerala)	Trivandrum
2	PLACE/ CONTEXT:	Urban	Urban	Urban	Rural	Urban
3	AGE OF THE OWNER/ OCCUPANT/ USER (IN YEARS):	58	35	27	64	69
4	OCCUPATION:	Govt Job	Engineer	Engineer	Retd Military Service	Scientist
5	HOUSE POSSESSION:	Own	Own	Rented	Own	Own
6	TYPOLOGY OF THE HOUSE	Independent; 3 bedrooms	Independent; 3 bedrooms	Apartment; 2 bedroom	Independent; 3 bedrooms	Independent; 3 bedrooms
7	HOW MANY USERS DURING THE TIME OF POSSESSION	5	3	2	2	5
8	AGE OF THE HOUSE/ YEAR OF CONSTRUCTION	10; 2002	17; 1995	10 Approx.	10; 2002	27; 1985
9	YEAR(S) OF OCCUPATION:	10 Years	2 Years	10 Months	5 Years	27 Years
10	NUMBER OF ROOMS:	12	7	6	7	11
11	COMMON SPACE					
	11a) BALCONY	Yes		Yes		Yes
	11b) CORRIDOR	Yes	Yes	Yes	Yes	
	11c) STAIRCASE	Yes	Yes	Yes	Yes	Yes
	11d) OTHERS, SPECIF	Verandah, Courtyard, Car Porch	Basement			
12	NUMBER OF PRESENT USERS:	2	3	2	2	2
13	ARE ALL THE ROOMS BEING USED THE SAME WAY THEY WERE DESIGNED FOR?	NO	NO	YES	NO	NO
14	IF NOT, WHAT REFINEMENT/IMPROVISATION HAD HAD HAPPENED? PLEASE SPECIFY WHY.	1. Reduction in number of occupants has resulted in conversion of ground floor bed room to master bed room and one of the first floor bed rooms to guest room. 2.Common corridor in the first floor is being used for keeping the solar battery and ups. 3. A/C has been fitted in two rooms. 4. Indian w/c had been converted to European due to old age discomforts.	1. Third bedroom gets used as a bedroom only twice or thrice a year. It is used to keep the crib and a spare futon, which doubles up as the bed. normally the washed clothes that await ironing and folding are dumped on the crib and futon. 2. A formal dining and drawing room remain empty as we still arent sure whether we need such a space. We are okay with friends/guests coming to our living room, and sharing the informal dining area. In the mean time, our baby uses those two vacant rooms for playing with her tricycle. That probably is a better use for that space.		1. Slight modifications in storage space in the kitchen to accommodate all gadgets. 2. Sitout being enclosed (put grills all around) with a safety door which can be locked. 3. Back terrace covered with galvanized sheet, to provide space for drying clothes	1. The old persons (mother in law and Grand ma died, their bed room is now guest room. 2. A toilet attached to Dining Hall was converted into a store. 3. Drawing cum Office room was converted to a full drawing room. 4. A corner of the large Dining hall was converted into a work station. 5. A utility room was converted into a library.
15	ANY RENNOVATION/ADDITION DONE TO THE HOUSE:	Renovation of the home garden.	Deck added.	No	No	One bed room was added when the sons got married
	REFINEMENT CATEGORY	FUNCTIONAL; TECHNOLOGY	FUNCTIONAL		FUNCTIONAL; MATERIAL; AESTHETICS	FUNCTIONAL

Table 1(B): Findings of the Sample Survey conducted during October 2012
Source: Data from Survey

CORPORATE

SL No.	QUESTIONS	USER 1	USER 2	USER 3	USER 4	USER 5
1	CITY:	Lemont (Chicago, USA)	Bangalore, India	Austin (Texas, USA)	New Delhi, India	Trivandrum, India
2	PLACE/ CONTEXT:	Urban	Urban	Urban	Urban	Urban
3	CORPORATE NAME:	Argonne	Wipro	Intel Corporation	Incubis Consultants	Glaxo Smith Kline
4	THE POSSESSION:	Own	Own	Own	Rented	Own
5	YEAR IN WHICH THE BUILDING/FLOOR WAS CONSTRUCTED/OCCUPIED:	Early 1960s	Not Available	2012	2007	2004
6	DOES THE BUILDING/FLOOR SHOWS THE CORPORATE IDENTITY?	NO	YES	YES	YES	YES
7	WHAT ARE THE COMMON FACILITIES IN OFF	Coffee machine, AC/heater, fan, toilet, a vending machine in the basement. A canteen located about a km away within the same campus.	Cafeteria, Rest Rooms, Medical Facility, Sports Area	Cafe, Fitness center, conference rooms, Restrooms, Parking lot.	Coffee machine, Pantry, Rest rooms, Material room, Common printers and xerox machines, Power back-up	Coffee machine, Canteen, Toilets, Medical Store room, Cold store, Conference room
8	WHAT MODIFICATIONS HAVE THEY DONE IN THE COMMON AREA?	1. Common area has only reduced in the past few years. 2. Coffee machine moved to a smaller enclosure with fax/copier etc. (to make room for some more cubicles). 3. Placed some large TV screens in the lobby to show some videos about the work done in the lab. 4. The rooms were made larger last year by breaking down some walls, to accomodate a larger team, in the same hall. 5. Solar lamps have been placed near canteen. a solar EV charging station too is installed for employees (hardly ever used by employees).	1. Increased the area due to increase in number of employees.	1. There were some security weak spots. They changed the way of entry through some doors to close those loopholes	1. Vacant spaces have been converted into storage spaces for keeping material samples by adding racks. 2. Dish stands were added to keep the common plates and cups. 3. Cameras and motions sensors were fixed to increase security.	1. Increased the office space by adding more cubicles. 2. A TV and network systems were added in the conference room to enable long distance conference. 3. Increased the area for laboratories.
	REFINEMENT CATEGORY	FUNCTIONAL; TECHNOLOGY	FUNCTIONAL	FUNCTIONAL	FUNCTIONAL; MATERIAL; TECHNOLOGY	FUNCTIONAL; TECHNOLOGY

A. Reasons for Refinements

According to the table, four out of the five users (80 per cent) have done refinements to their living space which satisfied the immediate requirements they had and the refinements are still undergoing.

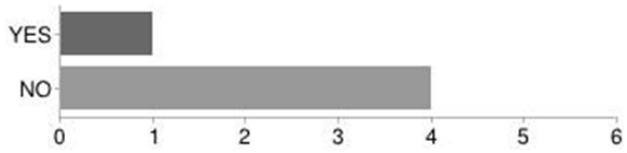

Figure 5: Graph showing the differences in number of users using every room as it was designed for against the number of users not using as it was.
Source: Data from Survey

There are several reasons which induce refinements or modifications in an existing space. Change in number of occupants over the period of time is one of the major reasons for the refinements that had happened. Marriage, birth, education, job, death are all reasons for change in the number of occupants of a particular home. An increase or decrease in the number of occupants and the time spent by them induce the change in needs for that house. Apart from that, the need for additional storage space is another factor which stimulates refinements in users' habitual space. Conversion or re-arrangement of existing rooms to accommodate new functions and activities, products and technical equipment is a minor refinement which is based on time, material and technology.

Different kinds of people have varied notions with respect to security and privacy. It depends on the socio-cultural aspect of the user, which varies from person to person, and the need for additional security and privacy, for example, restricting one or more entries, fixing new age surveillance techniques and the restrictions of space as a consequence or adding grills or blinds, is another kind for refinement that happens when the user realizes the insufficiency in the privacy.

Old-age discomforts and early phase of old age are factors which call for major refinements and modifications of the living space. It can either create new functions for the existing space or, at the same time, can leave a space unused or it could demand the need of new equipment and devices.

"When physical and sensory setbacks occur with aging, many of the private homes in which elderly people have lived for years are no longer suited to their new requirements… The representative survey of people over sixty living in German speaking Switzerland that was conducted as part of the Age Report shows that 51 per cent of those surveyed believed their homes would be unsuitable if their mobility were to become restricted… many of those in the early phase of old age are thinking more about changing their living situation and in some cases are open to new forms of housing… is converting homes to making them suited to the elderly- for example, installing a stair lift or attaching handles, and so on. Renters and condominium owners have less latitude in such decisions as the owners of single family homes, however."

(Huber, Andreas, Hugentobler, Margrit; Walthert-Galli, Regina: 2008)

B. Factors Triggering the Refinements

There are some factors which trigger the refinements happening at a particular space and that can be concluded from the survey data of residential and corporate spaces mentioned in Table 1(A) and Table 1(B) respectively. They are prioritised and classified as follows:

The division is done under four main factors of refinement,

Time	Present immediate needs
	Future needs based on aspirations
Functional	Ownership
	Occupants to room ratio
	Safety & Privacy
	Accessibility
Material and Technology	New and Improved Materials
	New Technology
	New Equipment
Aesthetics	Age of the Building (renew/renovation)
	Order & Complexity
	Visual Quality

Figure 6: Diagram showing the Classification and the factors prioritised within.
Source: Author

that is, Time, Function, Aesthetics and Technology, the divisions much quoted by architects. As shown in the diagram, refinements generally happen mainly because of functional aspects, apart from the time factor, followed by introduction of new and modern technology and equipment. The aesthetical factor is seen to be holding the last priority for a user refinement. The factor of time acts as an axis on which all the other factors are related to.

VIII. CONCLUSION

This paper delineated the various aspects related to the relationship between the architects and the user and his ever-changing needs: what are the possible reasons for the change in needs; what are the factors triggering the subsequent refinements and an overview of the new approaches evoked in the professional culture that is evidence-based, social, process-based and user-oriented.

There is only a limited relation between the architect and the user at present. Instead, if the relation extends on a time bound scale, the architect would be having a record of the history of the user right from the design stage to that particular period. These details and knowledge would give the architect a better understanding of the user and it would also help the architect to forecast the user's immediate requirements from time to time. The relationship continues boundlessly and thus the design process of that building never ends.

If the user himself makes refinements in the design at a later stage, there are chances that it would degrade the architectural value of that building in terms of usability, material, and aesthetics and so on. With the wide spectrum of understanding in designing, construction, technology, material and the user's specific data, the architect would be able to propose a better design solution which could either maintain or, sometimes, even enhance the architectural quality of that particular building with respect to the user and his needs.

ACKNOWLEDGMENT

The authors wish to thank Dr.Ramesh, Head, Department of Architecture, School of Planning and Architecture-Vijayawada-India for his valuable guidance and co-operation during the inception of the research work. We wish to thank all the people who contributed information for the space use survey.

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