SIGNIFICANCE OF DESIGN IN THE USAGE OF A SPACE – A CASE OF RESIDENTIAL BUILDING

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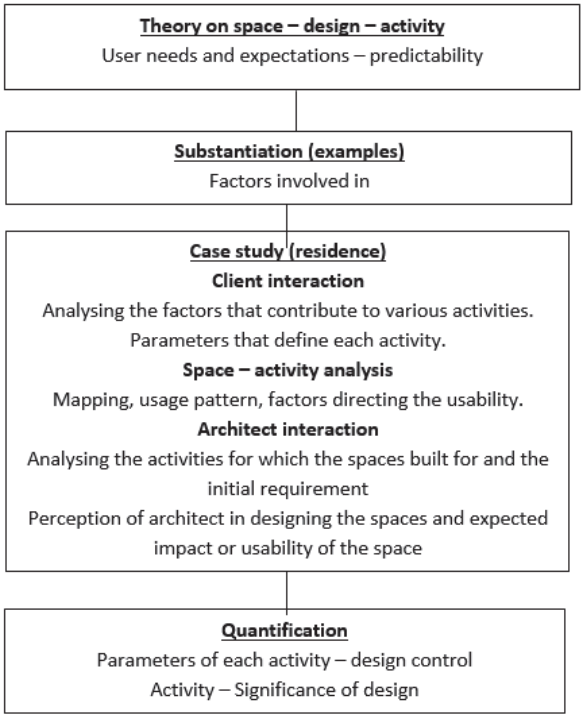
Abstract: Architecture can be broadly termed as designing spaces. Spaces do have great influence on the behaviour of the users and the vice versa that users influence the character of the space holds equally good. A space which is designed or made (by humans) has a purpose it caters to. The same space will have a good degree of flexibility which may cater the function or the purpose it is not designed for. The unintentional usage of the spaces good or bad, might be a conscious effort sometimes. The gap between design thought and flexibility is caused by multiple factors (instantaneous circumstances, social, user behaviour, changes in the continuum) and might not be always thought of during the design process. Looking after the real time usage of the designed space can indicate to what extent the usability of a space can be perceived during the design stage initially. This paper deals with the residential building and the usage of the space and the factors that influence the usage of a space though not designed to achieve the same, thus predicting the degree of interference a designer can actually make consciously or unconsciously.

Keywords: Design, Usage, Flexibility, Significance, Uncertainty, Perception.

Aim: To quantify the uncertainty in the usage of a designed space in a residence.
Methodology:



Objectives:

- To identify the factors that define the flexible usage of a space which further defines various parameters involved through exemplified data.
- To identify the different activities and parameters involved in the selected residence.
- To analyse the parameters with respective to design control.

Introduction: Space is defined as a continuous area or expanse which is free, available or unoccupied. A space becomes habitable when people start adopting the space according their requirements and needs through manipulation, defining the boundaries, creating a suitable space within. Design can be defined as a plan for the structure and function of an articraft, building or system. A man made space is carved out to achieve or cater a purpose or function. Such controlled environment sustains the life of humans which are the true shelters termed as houses or buildings. The first known shelters of humans were caves which were naturally formed, so caves which caters the basic purpose of protecting people from sun and rain also caters to other functional needs of the people like storage, living, walls for art work: though not intended to. Built environment need not cater the direct purpose but humans may adapt the usage of the space depending on the requirement. The degree of freedom of a space can be defined by the flexible usage of the space to various functions. The design intent of a space need not always have the conscious effort to foresee the happenings and resulting usage of the space. The predictability of the usage of a space is limited confined to a few parameters of the thought process while designing the space.

"The final goal of architecture is not the building of convenient houses; it is also not the blowing up of abstract sculptures and calling them exhibition pavilions. Its aim is to be a regulator of the rhythm of social and individual life." (Quote by Modernist Polish artists Katarzyna Kobro and Vladislaw Strzeminski, 1931). The statement emphasizes the character of architecture not just a concern about mere designing spaces or buildings but also a strong motivator in the people's realm. This realm does involve different activities an individual is associated with or made associated with. Architecture has an ability to create opportunity through different activities or has the ability to respond in the flexible usage of the space for different activities. Deciding upon the activities a space contributes to is very important for the everyday life of the people. "Regardless of style or aesthetic the greatest impact architecture has are the way it frames our everyday lives, our routines, practices and little mundane things we have to repeat over and over again" (Louis Dias, 2006). Architecture should be perceived in the social dimension which is influenced by several factors rather just self-consciously artistic. This inflicts on the society, removes or reshapes a piece of existing space, a responsibility to an individual who determines the outcome. The uncertainty in various factors considered while designing makes it difficult to predict the usage of such outcome.

"Architecture is always concerned with time; buildings are created of certain circumstances and are designed to fulfil a particular purpose. Change is a natural condition of life. In addition to the natural process of aging, which architecture is also subject to, the changes made by the respective users play a particular role in the building life. Our surrounding are influenced by architecture from wider landscape to the local neighbourhood, buildings determine the character and appearance of an environment" (Architecture in the existing fabric – Johannes Cramer). The chronology of various events influenced by different factors do change the requirement, the way of living, usability for a given set of users, which demands an change or addition sometimes to the spaces which were designed earlier with different set of requirements and conditions. So, though a well designed building goes in to continuous change in the usage and caters to various other functions which may change in a organic process rather than a well formulated process. This organic development is very much evident cause of the degree of freedom a space has to evolve, transform to the user's needs.

The results of the design thoughts are not always pre conceived or need not be conceived the same as the end result and might have several other results along with the conceived implying various other factors do influence the conceived usage. This strengthens the idea of the multiple factor influence on the space which one may not or cannot perceive. Sensitivity of the design decisions, the way they

respond when set to use in a given condition and their impact not pre thought is better understood by the exemplified data through various intervening parameters social, cultural, economic, technological, and functional and elements of architecture.

Exemplified Data:

a. **Example 1:** The placement of the openings plays a crucial role in connecting different houses and intervening activities within the house hold. The following figures analyze the different connecting patterns visually and socially in the cluster.

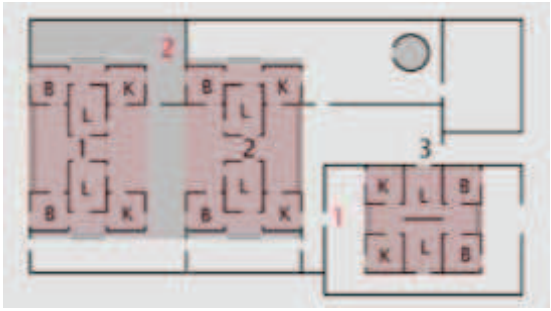


Figure 11: Cluster Layout

Figure 1 shows the three house clusters and the arrangement of rooms. The places 1, 2 shows represent the focus zone of analysis.

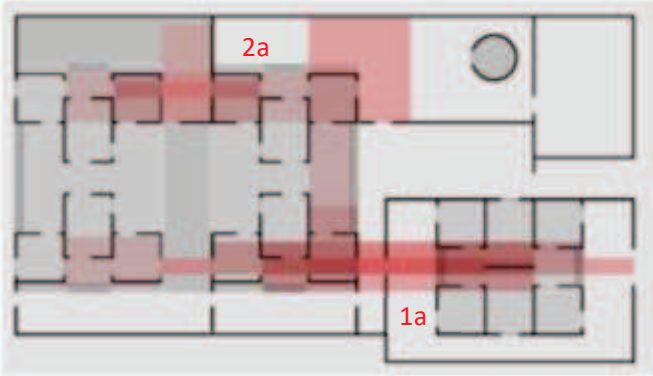


Figure 12: Layout OF A Cluster And Visual Interaction Patterns Through Openings

Figure 2 depicts the existing three house cluster and visual connection between these houses which induce the cluster activity. The fenestration of the room and the activity they are making permeable to the neighbours creates an interesting interacting pattern. The design of the fenestration to provide the rooms with optimum ventilation and light might not be thought to induce the purpose they cater to, but these fenestrations have the broader implication in the daily lives of the people living in the houses. Altering the positions of the windows and doors though cater the same purpose of entrance and ventilation can completely alter the living activity.

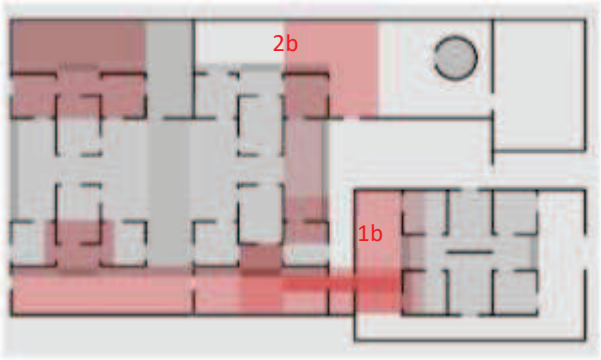


Figure 13: Altered Fenestrations And The Change In Visual Interaction

Figure 3 depicts the layout of the same cluster with altered positioning of the openings in the zones 1 and 2 and named 1b and 2b respectively.

Analysis:

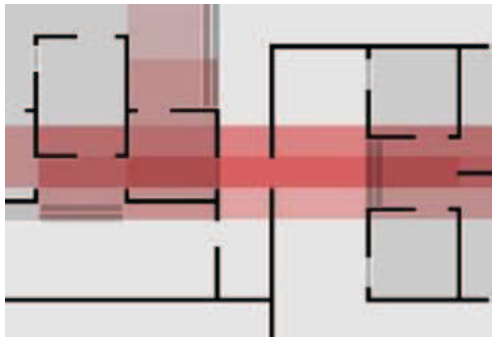


Figure 14: Detail 1a

The placement of opening aligning with the window of the kitchen connects the living and kitchen activities to the active backyard of another house.

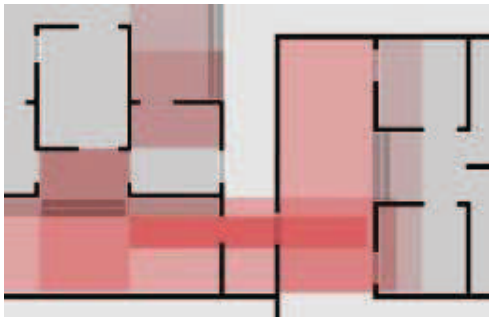


Figure 15: Detail 1b

Moving the opening down, so that visual connection is lost disturbs the whole set of activities and the structure associated with it. The broken pattern is restructured through the backyard of both the houses.

Figure 16: Detail 2a

The aligned openings connect the backyard to the bedroom of house.

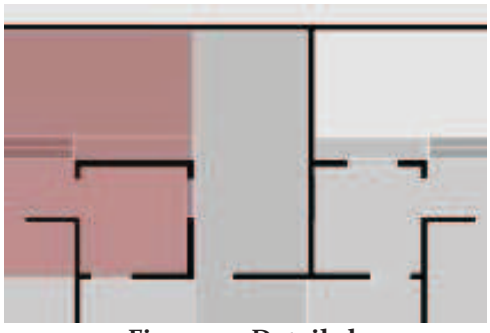


Figure 17: Detail 2b

Closing the opening with a blank wall completely closes the frame work of intervening activities at community level. Good or bad the architectural elements have their impact on the social structure which responds and forms a framework in which these activities work.

b. Example 2: Sectional level analysis of change in character of two spaces helps in understanding the role of design elements in deciding the usage of the activity though not conceived during design.

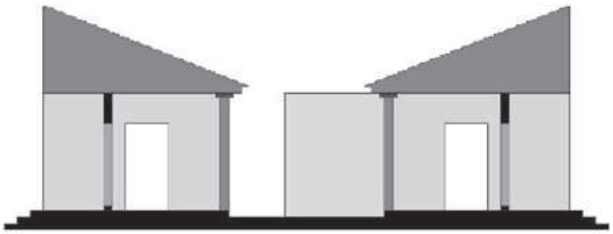


Figure 18: Section with Plinth

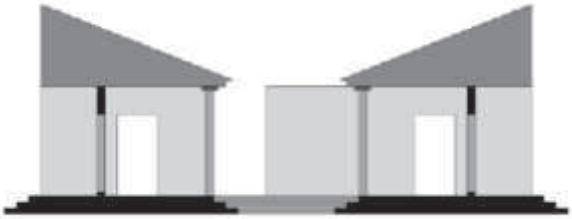


Figure 19: Section Without Plinth

Figure 8 shows the buffer space between the two houses with a raised plinth associated with the activities of playing; drying clothes, rather assuming the space with steps down to the ground level forms a courtyard which would allow gathering around as shown in figure 9. The treatment of the space with plinth, steps though not given a thought about their usage in the overall social structure to detail the activities, makes a huge difference in the way the social structure work around.

c. **Example 3:** The response of the religious space to the community depends on how the interface is treated. The following figures illustrate two cases in which the interface is treated differently with boundary wall as an element of design.

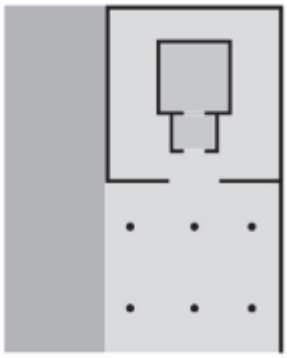


Figure 20: Temple without Boundary Wall

Figure 10 shows the case where the mandapa space is opened to the road which lets in the people throughout the day making it a community space for the village. The religious space is associated with the community space in a broader perspective other than the religion itself, mere public gathering space.

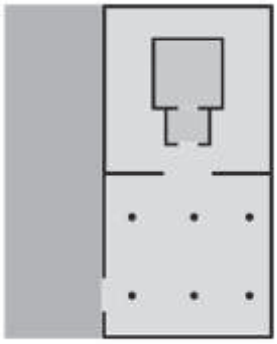


Figure 21: Temple with Boundary Wall

Figure 11 shows the mandapa space separated from the road segregating the activity in the mandapa from the public. The frame work created in both the cases is different; pertaining to the activities bound within and has different impact on the surrounding frame work.

The boundary wall construction was never thought in a social perspective, neither expected to be an element of change. The uncertainty in the design decision of aiming at a purpose but ultimately leading to other in a broader perspective can be understood in this example.

Factors of Uncertainty:

- **Adopted For A Reason – Responding To Another:** The design strategies might be adopted to achieve certain activities to happen but end up resulting in different or more activities. Many miscellaneous parameters which are instantaneous and out of anyone's control may contribute to this behaviour of usage.
- **Culture & Life Style:** Different cultures trigger differ in different way of living, cooking, habits and rituals which completely change the usage of a given space. Two different families might respond differently to the given same space.
- **Flexibility In Space – Designed But Not Decided Rigid:** Many spaces designed are thought to an extent of generalise utility but not to the full which might take into count of the individualistic psychic and personality. There is always flexibility in the space though designed rigid enough to control an activity.
- **Changing Requirement:** Chronological factors like aging, families extending, technological advancements, revolutionary ideologies, personal psychic can result in continuous change in requirement in the space we live. So the design conceived during the initial stage with the requirements at that point of time might vary which result complete different in usage of the space and modification in the space in some cases.
- **Uncontrollable Social & Economical Dynamism:** Economic and social factors always deal with people and happenings around and not completely in a self control. This result in the most unpredictable conditions of usage in a designed space, neither the designer has control nor the users.

Parameters: Parameters are listed out based on the designer's consideration while designing such as climatic, client's requirements which may explain the lifestyle of the users, spatial arrangement or the design, economic status and also the factors that induce the flexible usage of the space such as culture, lifestyle, elements, miscellaneous and spatial arrangement which questions the uncertainty to the significance of designed spaces.

- Culture
- lifestyle
- climate
- social structure
- economic structure
- instantaneous/ miscellaneous (out of anyone's control)
- spatial arrangement
- elements

Scope: A residential building is selected for this analysis; residential buildings have the original traits in the usage unlike the other typology of buildings like public, leisure; where the function of the space is pre decided and controlled which limits the scope of understanding the flexible usage of space under various factors.

Limitation: Activities indulging core traditional, cultural, lifestyle parameters are omitted to have a fair understanding of the design and the flexibility.

Case Study: A residential building is selected for the case study.
Location - kanuru, Vijayawada.
Designed by – Architect.

Users – Father, mother, two kids and maid family.
Economic class- upper middle class
Religion – Hindu
Previous house – rural setting.
The following figures shows the various floor plans of the selected house

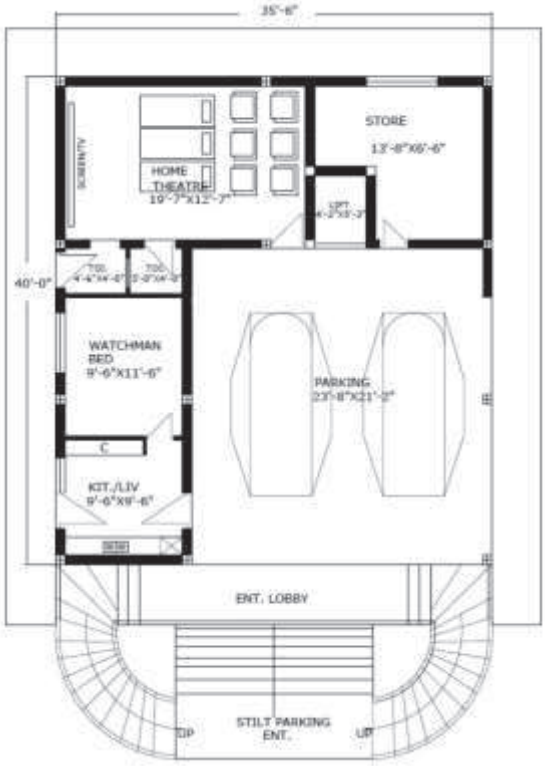


Figure 22: Stilt Floor Plan

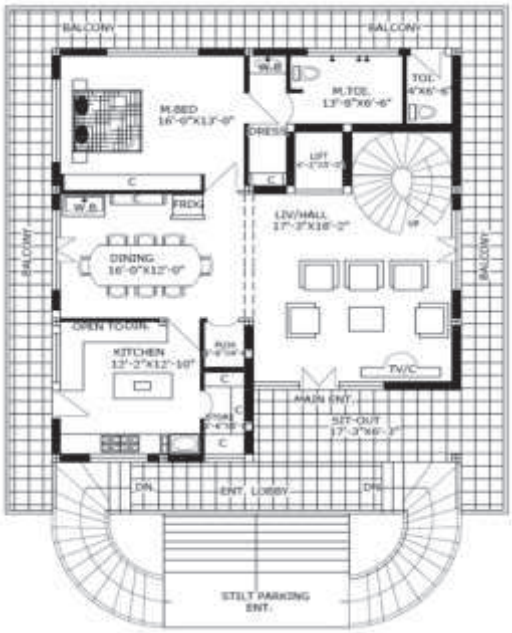
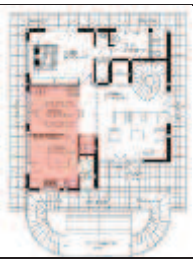


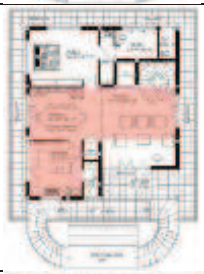
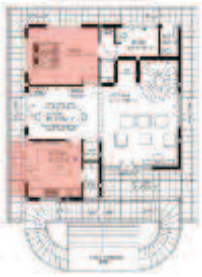
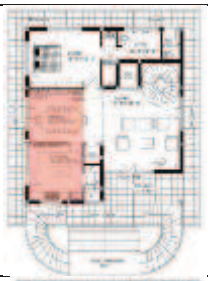
Figure 23: Ground Floor Plan

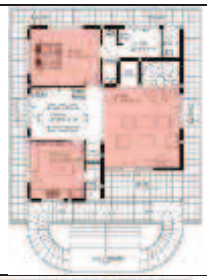
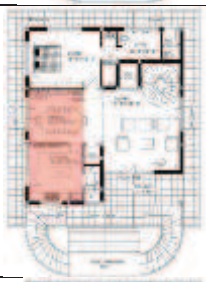
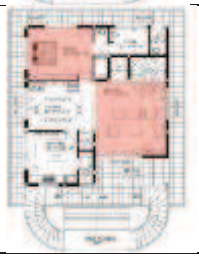
Figure 24: First Floor Plan

Figure 25: Sectional Zoning

Space Activity Analysis:

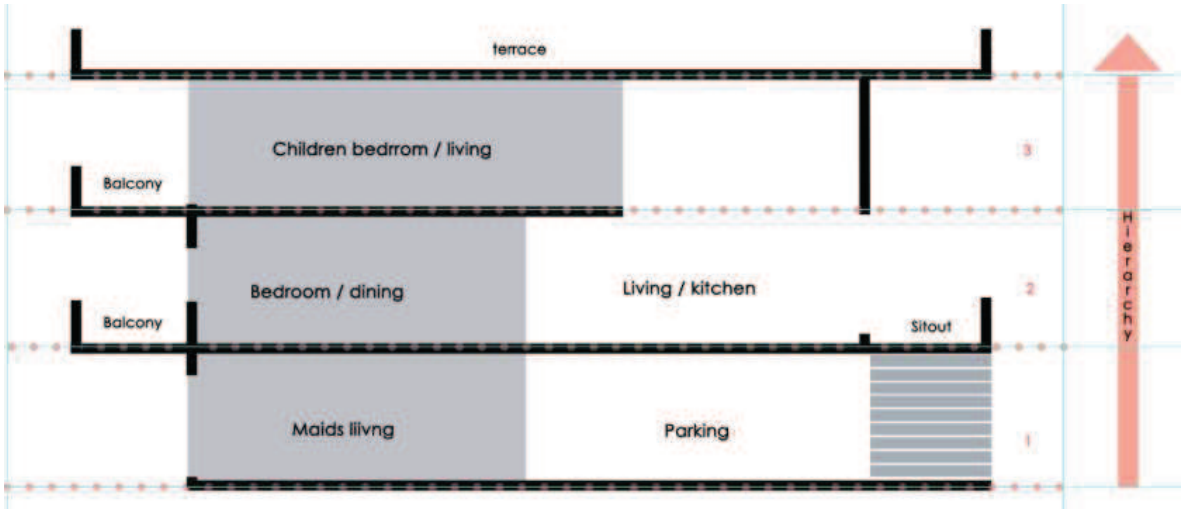
Time	User	Space	Activity	Remarks	Illustrations
6AM	Mother	Bathroom, Kitchen, pooja	Cooking, pooja	-	

7AM	Father, mother	Bathroom, kitchen	Cooking	Ground floor usage	
8AM	Kids, father, mother, Maid	Bathroom, kitchen, dining, living	Eating, cleaning	Kids in the top floor and parents in the ground floor, maid from stilt floor.	
10AM	Mother, maid	Kitchen, bedroom, utility	Cooking, nap, washing utensils, clothes	Bedroom nearby kitchen used to take nap and open kitchen allows to look after cooking activity	
12PM	Mother, father	Kitchen, dining	Eating, serving food.	Eating and chatting enabled due to the open kitchen and dining.	
3PM	Mother, father, maid	Kitchen, living, dining, utility, feeding dog	Snacks, washing utensils	Proximity of kitchen, hall, dining and the sit out where the do is tied	
5PM	Mother, kids	Kitchen, dining, sit out	Chatting, eating		

7PM	Mother, kids, father	Living, kitchen, bedroom	Television, cooking, gaming, internet	Three dispersed activities with parents in ground floor and kids in first floor.	
9PM	Mother, father, kids	Dining, kitchen	Eating, serving		
10PM	Mother, father, kids	Living, bedroom	Television, gaming, internet	Dispersed activities.	

Interaction with the Designer: Client's requirement – Four bedrooms and lavish toilets, living, kitchen, pooja, sitout/leisure space, home theatre, maid room.

Architects Take Over: *Design started with the sectional zoning in the hierarchy of space usage with maid's room and parking in the ground floor and main residential duplex on the top floor. Zoning in the residence follows with master bedroom, kitchen, dining as a interlinked space in the ground floor where as children's bedroom was conceived in the first floor visually connected through the double height space in the living.*



Balcony around the house shades the exterior walls from direct sun light, design conceived when there were no buildings in the surround region.

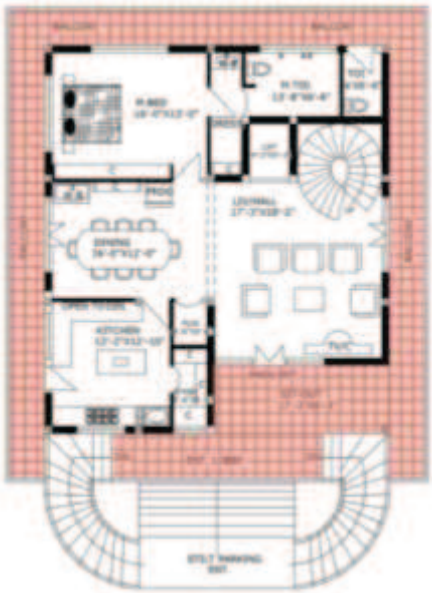


Figure 26: Balcony Around

Floor plan completely zoned to vastu with

- Master bedroom – South west
- Toilets – North West
- Kitchen – South east
- Living / entrance – North east
- Pooja – North east.
- Stairs –towards west

Figure 27: Cardinal Directions

Analysis: Analysing the parameters involved in activities, the cause or the reason through the observations and designers perception of making the space, the parameters which a designer has control on are identified which gives the score of the design control in an activity happening in the residence. The parameters with design control are marked in red.

No.	Activities	**Parameters** – designers pre thought	**Score** – design control
1	Early morning – pooja room and kitchen	***Culture***, lifestyle, ***spatial arrangement***	0.66
2	Kitchen and maid – sit out	***Social***, spatial arrangement	0.5
3	Double stair case - Dog	economic, instantaneous	0
4	Bed room, dining, kitchen – most used spaces	***Tradition***, spatial arrangement.	0.5
5	Open kitchen – half wall	***Element***, social	0.5
6	Half wall - Seating, Table, boundary.	Element, social	0
7	Balcony around – shading Buildings emerged around in later stages	***Climate***, chronological evolution, social	0.33
8	Second entrance in the living room - interaction	***Tradition***, Social	0.5
9	Children bed on the second floor – null activity	***Economic***, social, lifestyle	0.33
10	Large kitchen with central space - daily cooking, festive seasons.	***Economic***, tradition	0.5
11	Living room – leisure	***Spatial arrangement***, ***social***	1.0

Quantification: Plotting a graph with the activities and their respective design control scores gives us the area with uncertainty in predicting the usage of space controlled by the parameters listed.

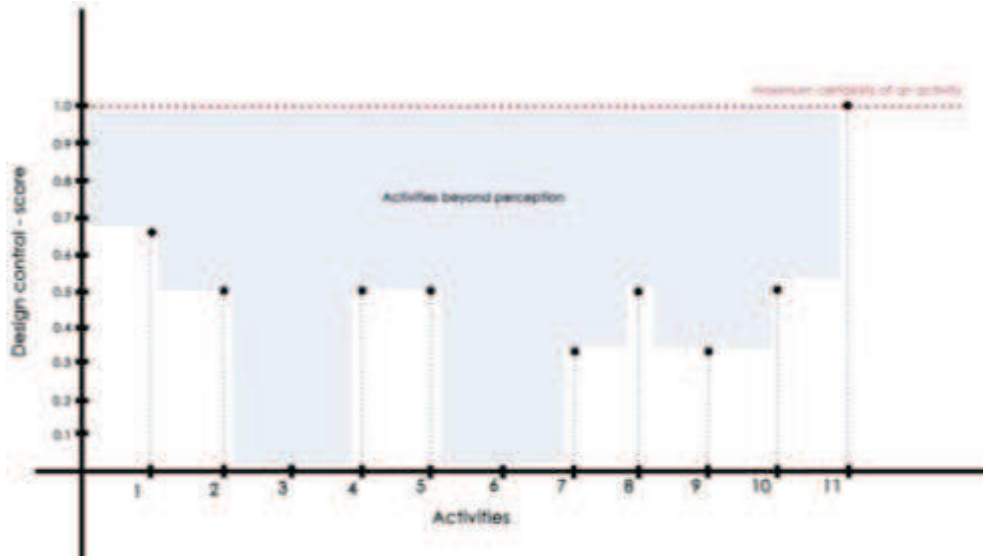


Figure 28: Graph of Activities and Design Control Score

Regression Analysis: This gives the relation between the design control and the activities happening in the residence, if directly relation implies the good significance of design in the usage of the space indicating the perceived usage of the space is evident. Indirect relation implies the usage of the space is not influenced by the design but by external factors.

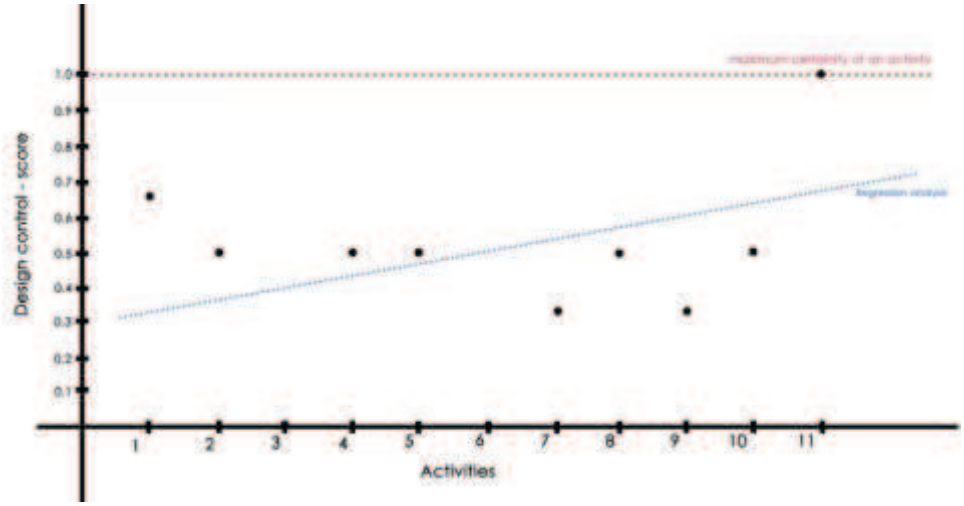


Figure 29: Regression Analysis

Here the linear regression analysis for the residence in the case study shows the direct relationship which indicates the significant activities are design dependent not to mention whether good or bad.

Conclusion: The present case study helps in understanding the various activities involved in using the space designed and quantifying the actual attempt of conceiving the usage of the space by the user. This enables to understand the fact that though spaces designed, made thought of a cause, need or purpose need not always respond to the same, good or bad the consequences might be, the broader context always has its role in driving the activities in a space. Design in the sense of space making s a real tough job to predict the outcome in various scales we perceive. This paper substantiate the idea of the uncertainty in the usage of space which is beyond the control of space making thought to achieve the purpose intended.

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