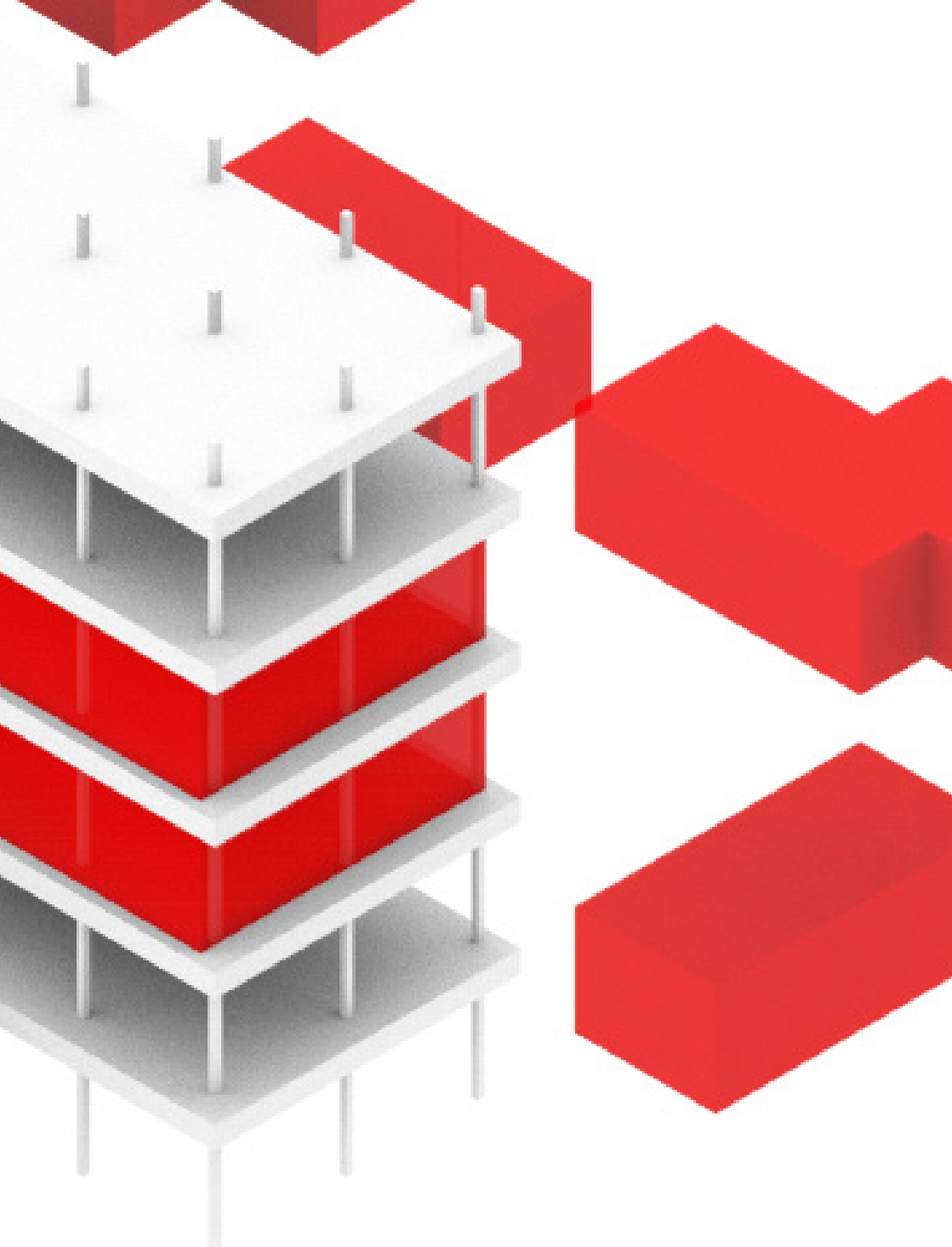


Relevance of Support and Infill

Naitik Trivedi

Introduction

Urban migration is on the rise in the Indian cities. Due to shaky reliance on Agricultural economy and government's push towards manufacturing and IT industries one finds rural population starting to move to the urban areas.

So in a country like India, housing will remain in demand for a long time. Developers are and will continue to tap on this demand to their maximum benefit and keep producing mass housing schemes. As the cities also grow the public transportation system, co-working spaces and public amenities will be growing alongside it. So infrastructure growth will majorly shift from investment in the private sector to investment in the public sector. The mass housing that will emerge from this shall be more focused on cost cutting and space saving than on the quality of space for the homeowners.

When public transport, co-working spaces are used it becomes an age wherein the only individuality left would be that of owning a home. It would then become a basic need to have a home that provides that (individuality) to you. Habraken describes dwelling as a process in every man's life and it to be completely decided by logistical decisions of developers will not be fair to this process.

Other than individuality the other factor to consider in housing is adaptability.

Rural population moves into the city and usually start by renting out a small room and as their financial stability increases they would rent out a small apartment. As the time passes as the person marries he/she moves in a larger house, after childbirth he/she moves in an even larger house providing that his financial status is continuously increasing. They will sometimes prefer to decrease the size of the house or rent out a space when their offspring move out as their income stabilizes or even stops after a certain age. There might be some cases wherein the parents from the rural area will move in with them for better care

Along with the above described lifeline of an average urban migrant he/she might feel the need to have alterations in his home to personalize it or upgrade it.

There is a scope in housing wherein the developer can involve the homeowners in the designing process and also earn decent profits from it.

The Support and Infill theory by John Habraken

Some of the main principles of this theory are:

a. John Habraken sees the housing as a process. The issue is not just to provide a roof over people's heads but to create conditions that will, eventually, give everybody a decent house.

b. Change over time is important. The recognition that things change over time and must improve over time should be introduced in our thinking of housing.

c. Recognising that every user has different values and needs. It is impossible to find solution that fits everybody. A house being a personal thing, must adapt to the user. People want to share a community and type of dwelling, but within that they want to identify themselves as different from their neighbours.

'A support structure is a construction which allows the provision of dwellings which can be built, altered, and taken down, independently of the others.' Habraken. It consists of structure (columns, slabs), services (piping, cabling) and circulation (stairs, passages).

Infill comprises of partitioning walls, kitchen and bathroom equipment and all the conduits for electricity, heating, water, and gas, needed to operate the equipment.

Understanding the Support System:

Support system needs to be designed such that it offers the maximum flexibility to the users of the space in terms of orientation of spaces, openings, ventilations, additions-subtractions and alterations.

Usually a RCC frame structure is used to provide flexibility. But due to the already dictated grids of this structure(the beams), people usually respond to that grid instead of making spaces based on their needs. Therefore, the developer also suggests false ceiling that accommodates wirings and ventilation ducts.

RCC Flat slab can also be used for this purpose as it provides a flat ceiling on the floor below hence providing a unified singular space both physically and visually. It reduces the cost of addition of false ceilings to cover the beams, but then special accommodation for ventilation ducts and electrical cables must be done.

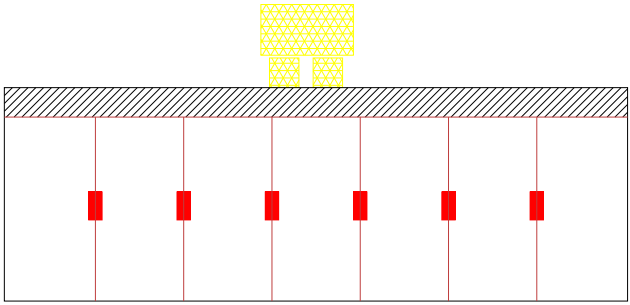
Types of flexiblity:

1. Functional Flexibility
2. Dimensional Flexibility
3. Temporal flexibility- ability to change the use of a room on the basis of time
4. Organisational flexibility - change the order of the room
5. Additional Flexibility - add more rooms
6. Far greater opportunities for people to make their personal markings and identifications.
7. Changing weather - summer and winter
8. Desires - bathtub, swings, modular kitchen
9. Short term activities - guests coming over

Placement of Vertical Circulation

Some of the studies that one can do on the shape of supports is the placement of Vertical Circulation:

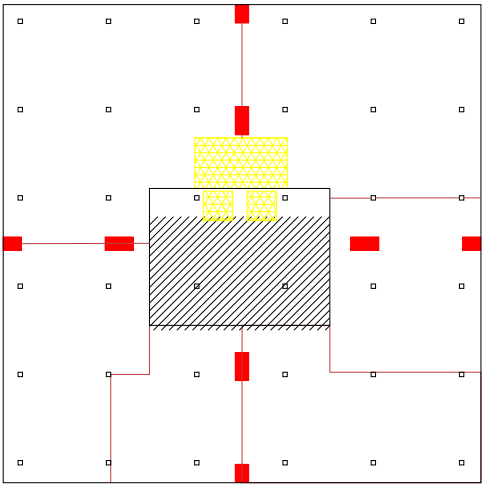
1. In keeping vertical circulation outside the shape of the housing units



The linear building shall be divided into equal pieces. Each of these will have a connection to the outer public lobby, a window for ventilation and a plumbing duct. Homeowners can buy as many divisions as they want.

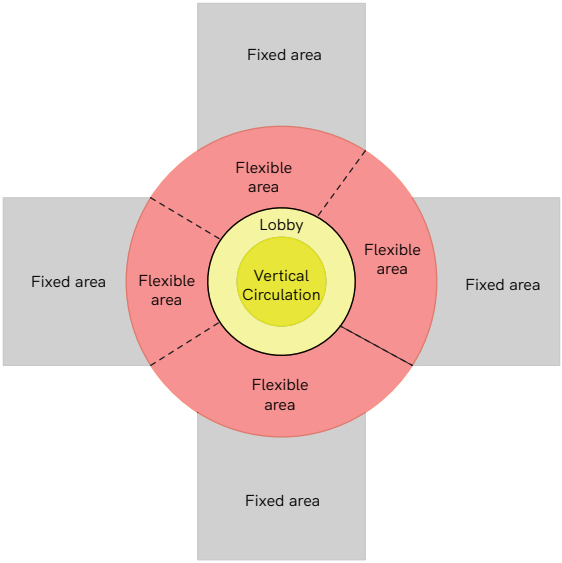
Cons: Linear lobbies are formed which would not be counted in FSI therefore expensive for the developers. There will also be problems in ventilation of the units.

2.a. In keeping vertical circulation inside the shape of the housing units



When the core comes inside the shape there are possibilities of having ‘L’ shaped apartment units that have ample of ventilation. The home owner can select how much of the area does he want to buy and construct.

3. In having 2 different parts with varying flexiblity



The first part is wherein the house buyer has the facility to choose how much area to buy. The second part is the area that the house buyer has to compulsory buy.

Less flexibility is offered but the structure still remains more organised and controlled in its division, therefore reducing the conflicts between the users in issues regarding entrances and ventilations.

Plumbing System

A study of the location of service shafts, orientation of sanitary fixtures, accommodation of pipelines, waste water line and its connection to gully trap and inspection chamber becomes crucial.

An overhead water tank provides water to the bathrooms and kitchens and a sunk slab or a raised floor is used to accommodate the pipelines.

These pipelines through a plumbing duct or through the façade of the building reach the gully trap and the inspection chamber which are underground.

Location of service shafts along the periphery of the dwellings and one shaft located centrally in the dwelling creates a possibility of locating toilets almost anywhere in the house. Peripheral toilets do not require a sunk slab. Increasing the possibilities of having toilets anywhere can be increased by suspending plumbing lines from slab and covering up with a false ceiling.

In places where the toilets are situated centrally, location of mechanical ventilation shafts becomes crucial.

Electrical System

A study of how wire have been accommodated and taken across the house, provision of amount of electrical voltage to each house and hence the possibility of addition of higher voltage electrical equipments becomes important.

Provision of distribution points in slabs and taking wiring from room to room through slabs is a better option compared to chasing through walls and weakening the structure. Slab is a more permanent element compared to partition walls.

Understanding the Infill requirements

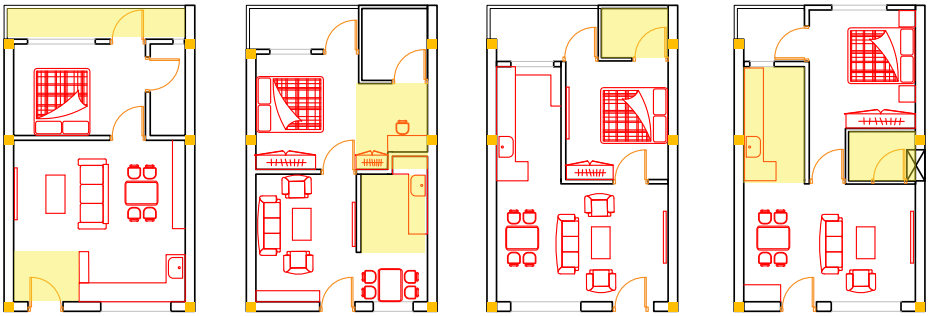
The infills shall be bought from the local markets and there might or might not be an involvement of an architect or interior designer. These infills would be standardized and changes would be easier to make in such structures.

Changes to the existing infill structure should be scheduled such that it does not become a nuisance. Rules should be made to adhere to the basic standards prescribed by the developer/architect and also to ensure that everyone has a fair space and the public parts of the building are respected.

A whole new industry of infills shall be generated with companies spending huge amounts of money in R&D, something which architects aren't capable of doing.

The old products which are substandard will be replaced by better as people stop buying them. Competition will keep the prices down and the companies will keep on improving. On just changing a window will give the feel of newness and upgradation. This could become a pan Indian thing wherein if you are shifting from one city to another you can just carry your infill with you.

Understanding the importance of different configurations in a same area block based on different family preferences.



Above are the drawings of different unit layouts for a same area block. It can be noticed that:

a. The size of a bedroom due to a double bed and wardrobe re mains more or less the same.
b. Relationship between the living room, dining area and the kitchen can offer multiple options that gives a whole different usage of spaces/activities and spatial quality of the home.
c. The secondary spaces such as the hallway, study space, balconies can be added or resized according to the needs of different people.

Also in keeping up with the uncertainty of the future there might be some unconventional relationship between spaces that the user might want to have that meets his needs. The need might arise for non-labelled spaces that serve some purposes that architect wouldn't have designed for.

Understanding the changes in an existing apartment

The need of the family for change and growth can be categorized as follows; (Dhwani, 2017)

-Increase or decrease the number of bedrooms
-Make spaces for studies, home businesses, hobbies.
-Increase storage space

In order to improve the quality of life

-Replacement and/or additions to kitchen and bathroom fittings and furniture.
-Provisions of new equipment such as dish washers, microwaves and ovens, washing machines, dryers.
-Creation of Utility room.
-Add more bathroom
-Addition of Storage space
-Installation of central air conditioning.

Rearrangement of subdivision

-Alter relationship between kitchen, dining and living room by opening up or closing up.
-Create separate children's room
-Alter partition to gain advantage of subdivision

Rezoning of home spaces based on Child/Adult, Formal/Informal, Day/Night, Noisy/Quiet.

-Relocated functions within existing spaces
-Alter partition layout
-Modify properties of existing subdivisions like solid core doors to double partitions.

To be different, to conform, to keep up with the next door neighbours

-Reallocate functions to spaces
-Alter partition layout
-Upgrade fixtures, fittings, decorations
-Upgrade services
-Accommodate new equipment
-Enlarge/reduce openings between spaces
-Add more floor space
-Add non-living functions like garage, storage, greenhouse

Challenges

This theory suggests the homeowners to take charge of their own environment and design accordingly. One of the concern that then becomes is the problem of choice.

Studies suggest that people are much less likely to buy any item (fast moving good) if there are several options available. Because then it becomes two decisions instead of one. Whether you want to buy or not? And whether you want to buy this or that? Whenever this happens the overwhelming options causes people to shy away from buying if they don't need it desperately. This happens to products but it is likely to happen with such infill projects, if the market is filled with several options.

The other concern is that when such infill products are readily available in the markets the homeowners will prefer to not hire an architect and instead will hire a contractor. I imagine the market to have several walk in samples of the infill ready just like in Ikea and the homeowners will pick and choose. This would lead to complete elimination of architects in the designing of the infill (sans the architects hired by the company for R&D). Will the homeowners alone be able to make a choice that is best for them?

A lot of the decisions of extension or openings in the walls would affect the neighbours. In absence of a particular set of guidelines to oversee these decisions the flexibility would turn in chaos wherein every home owner might neglect the privacy/conveniences of their neighbours.

Growth. Due to the restrictions in FSI, and the unwillingness of the developer to leave any residue FSI for future use, there will be no scope of a house growing in size except when one house wants to reduce the size of the house. This would rarely happen in a context such as India. Even if a homeowner is opting for a smaller unit, he would have to pay for the whole plot if he wishes to expand it in the future.

Emergence of a system to provide controlled flexibility

In order to increase the roll of an architect in the designing of a particular house and to offer multiple options that are well designed with adequate ventilation and light and minimum size requirements of the basic amenities, a alternative approach is proposed that may function better.

The architect starts by designing modules of the interiors of a household. These modules will be:

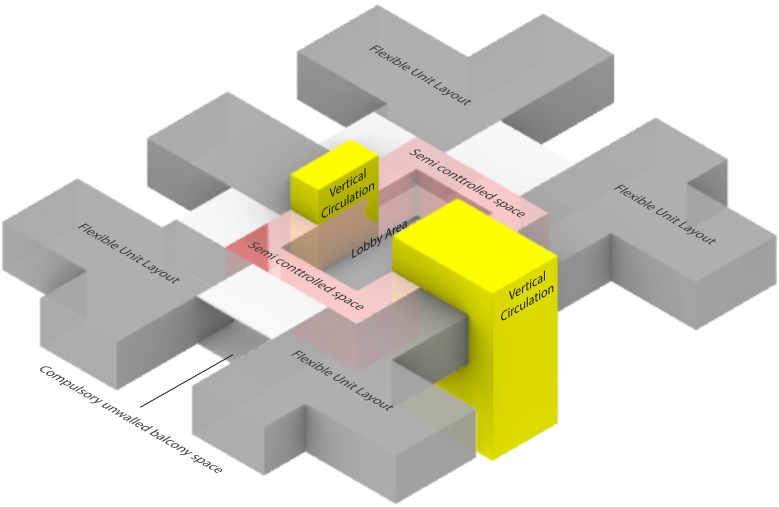
1. Toilet block
2. Living space
3. Dining space
4. Bedrooms
5. Balconies
6. Corridors
7. Storage/Anonymous areas
8. Staircases

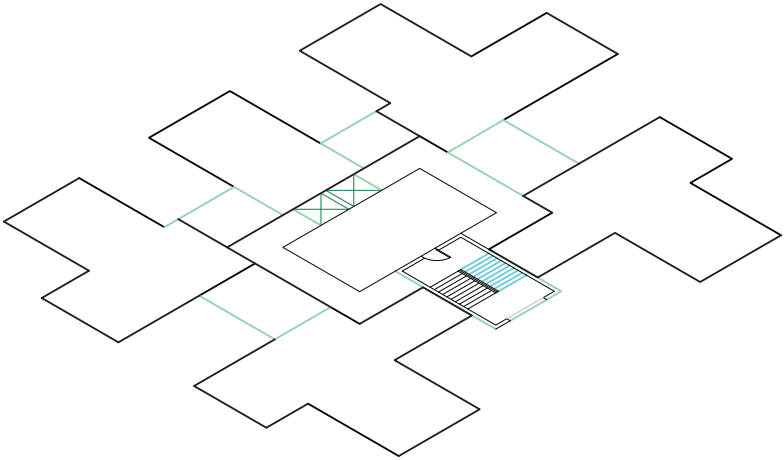
These modules would be easily attachable to another modules and will have definite rules regarding attachment, openings and ventilation and lights. The sizes of this module shall dictate the column grids and the service shafts.

These modules shall be modular even in their own construction with flexibility offered of increasing or decreasing the size of the module (by a factor already decided based on the column grid), having different add-ons, replacements, etc.

In addition to the configuration of the internal functions the home owners could also affect the community spaces formed outside their main doors by having a certain control over the position of their main door and openings facing this space.

Defining control over spaces and setting up guidelines

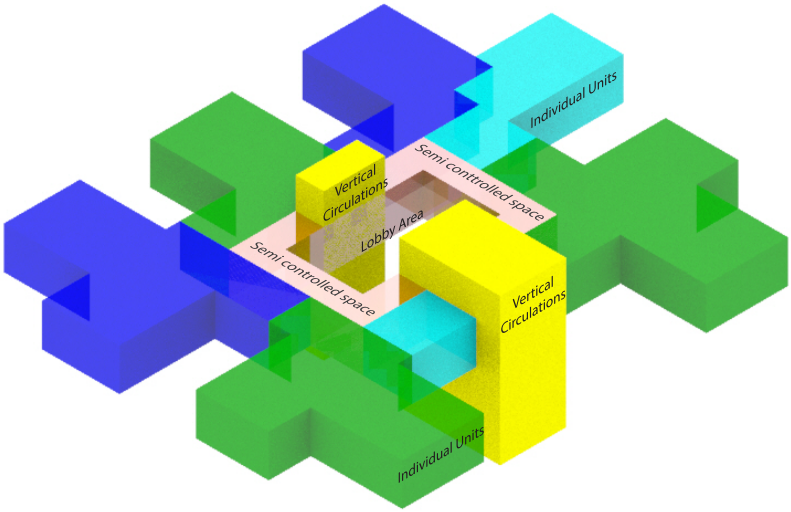




The spaces on a particular floor can be divided into 3 parts.

1. Completely flexible private space for unit layouts
2. Partially controlled private spaces to maintain certain standards
3. Fully controlled community spaces

The flexible unit spaces can be divided further into more units or many units can be merged to form one unit.



Benefits of such a system

This system offers almost all of the benefits of the Support and Infill system along with the following points.

The architect would then be able to set a particular standard of living that shall be followed in all the homes of that building. The architect would also have more control over the façade of the building.

Conflicts between the home owners would decrease due to limited number of options provided by the architect that have been well thought.

Logic of growth of the homes can be worked out due to controlled design of the modules.

Modules can be mass produced due to the availability of cheaper mass customization techniques in the market.