

# Maximising Utility in Minimum Space for Urban Development and Smart Life

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**Abstract**—In this modern India where quality of life is the top most priority of the citizens, lacks in space and comfort. Modern India's public spaces are better than its private spaces. There are public spaces tastefully cultivated for rich and poor citizens alike but our modern private spaces are mediocre. The research talks about urban development in India. Based on this scenario the urban India is studied to understand the aspects attached to urban development. Development also has many definitions but here this refers to the systematic development through technical and architectural knowledge. With the objective to create a better living environment for urban communities and propose an effective idea for space management.

Shelter is a basic human need and it will be! As the number of cities and towns has shown considerable increase in the residential need the challenges of urban development necessitate provision of housing and infrastructure for the rapid population growth this also presents an opportunity in terms of managing the urban sector in sustainable manner.

We are in the era of smart city. The concept of smart city was born to provide improved quality of life to citizens. What makes a city "Smart City" as opposed to a city where some "smart things" happen? In order to design a smart city a smart infrastructure plays a vital role. It is not just aesthetically pleasing but an introduction to smart life. Various researchers have attempted to define smart city from different lens but the objective of these approaches is the same—the life of citizens. This paper aims to define smart life rather than smart city in reference to the architecture while it utilizes experience from day-to-day life of urban people and corresponding theoretical contexts.

**Keywords;** Development, smart city-smart life, space management

## 1. INTRODUCTION

Smart cities aim to minimize the challenges that urban city face, there is no universally accepted definition of smart city. It means different things to different people. It could be smart design, smart utilities, smart housing, smart mobility, smart technology etc. It can be considered as a city which have intelligent physical, social, institutional and economic infrastructure while ensuring centrality of citizens in a sustainable environment. It is expected that such a smart options for all residents to pursue their livelihoods and interests meaningfully.

In this context, to provide for the aspirations and needs of the citizens, architects and urban planners should ideally aim to provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and applications of smart solutions.

The infrastructure in various cities cannot cope with the current population. People who live in decent home are better workers and make the city a thriving place. The challenge is to make life more livable for people who are drawn to cities to find jobs and create that growth. Smart city features do not touch the lives of poor people in terms of housing i.e. smart housing. The core infrastructure of the smart city can be further sub-divided in various parts. The Figure 1 depicts the various elements associated with the major physical sub-divisions.

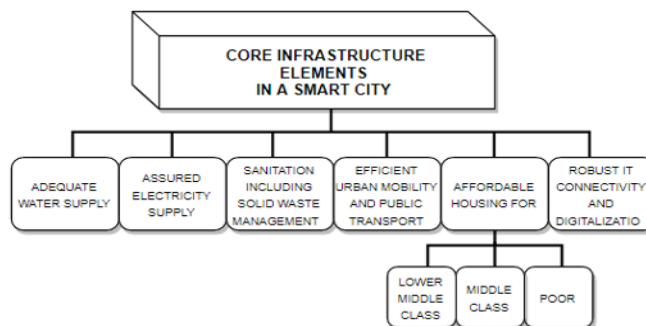


Figure 1: Core Infrastructure Elements in a Smart City

The rest of this paper is organized as follows: In Section 2, a formal definition of smart city and urban development in India is introduced. In Section 3 and 4, the idea of smart city transformation, space management and space utilization is presented. Section 5, shows how space management and utilization is inefficient. In Section 6 and Section 7, shows analyzation of space utility and presents the solution for space management, respectively. In Section 8 various innovative ideas for space management is presented. Finally, in Section 9 & 10, the main contribution of this paper is summarized.

## 2. SMART CITY AND URBAN DEVELOPMENT: INDIAN SCENARIO

The share of urban population in India's total population was 25.7 percent in 1991 which increased to 27.8 percent in 2001. About 377 million Indians comprising of about 31 percent of the country's population, live in urban areas according to Census 2011. Therefore supply of land and housing is challenging and need space management agenda in cities.

Affordable housing has now been made a national agenda by government of India with a mandate of 22 million homes by 2022. Conjointly, they have also put forth the aim of 100 smart cities 2500 smart villages by 2019. Additionally, the Real estate Bill was also passed which included many positive schemes for the industry like single window clearance for real estate approvals. The real estate sector would also have the opportunity to contribute to the goals of the affordable housing. Incentives such as finance options for low-income groups are also to be put in place. The High Level Task Force on Affordable Housing for All in its report in 2008 sounded the alert that if cities provisioning system are not put in place, then the low income groups would continue to live abominable life. There is currently a soaring gap between the demand and supply of shelters that needs to be urgently addressed. Shelters established nationwide for the people and the amount people they are collectively able to accommodate far surpass the actual number of people who need the facility.

## 3. SMART CITY TRANSFORMATION

The smart city concept can be looked upon as a framework for implementing a vision of advanced and modern urbanization. Governments need to develop an implementable strategy on ways to achieve the future development goals of a sustainable and competitive urbanization that can address social, environmental and economic issues in an integrated manner.

- This transformation from a traditional city to a 'smart city' does not just happen. Success depends on the quality of the decisions that are made and the way these decisions are executed.
- Smart cities do not emerge overnight but develop over the years. During this development process, cities grow from early maturity phases to fully developed maturity stages. The maturity model is used to assess the current maturity and to set goals for the aspired maturity.

## 4. SPACE MANAGEMENT AND SPACE UTILIZATION

As many as millions of people live in India's urban areas, and the value will go on. Proving a residence and a better living to each of the people is quite challengeable. Although increasing cost of land makes it more difficult for the middle class working people.

When these small houses encounter problems in their performance or require refurbishing and/or retrofitting, the owners (or the residents), often lacking in expertise, tend to have difficulties in finding solutions and are burdened with extra cost in reality.

Providing proper spare multipurpose furniture along with the planning helps the dwellers and fulfils their requirements.

- Space efficiency must be balanced against its effectiveness. There is an old saying in warehousing that states, "If there is available space, someone will eventually fill it," usually sooner rather than later.
- Space utilisation plays a vital role in architectural space management or planning. As the Morden urban people lives a Morden lifestyles and hence feels the need of separate space for different purposes. That is why space management ideas should be coined here in such metro areas in order to make the city spaces more functional as well as aesthetical.
- Planning in an existing built-up area through retrofitting to achieve smart city objectives, along with other objectives, to make the existing area more efficient and liveable.
- Utilisation studies provide information on how space is being used and help to inform decisions about the type and scale of facilities needed. Collecting the relevant data on both predicted and actual utilisation and evaluating current performance and the reasons for it, calculating the inefficiency and developing measures to optimise utilisation.
- Effective utilisation of space also creates a good match between space needs and space provision, and deals with the assessments of what is affordable need to be linked to the type space and amount of space that is required.

## 5. INEFFICIENCY IN CURRENT SPACE MANAGEMENT

Despite the wider introduction of space utilization, still utilization rates are low in parts of architecture, and it can prove difficult to achieve any significant increase. The problem is in taking initiative and a significant difference in the theoretical space management and its practical implementation. The problems may be greater for some types of space than others. Space may have been planned in order to achieve maximum utility based on anthropometry but as the requirement of the space increases that is where the anthropometry fails, so the proposed idea is to make it practically beneficial.

## 6. ANALYZING SPACE UTILITY

Smart growth demands the most efficient use of the space and resources. They have to provide an attractive and clean place

to live. There are a lots of following benefits that the concept of maximizing utilities in a minimum space offers.

- Lesser built up area more the landscape area: An innovative landscape that incorporates ecologically beneficially is very important to be reviewed in creating a sustainability of living environment. As well as provides pleasant and aesthetical environment for the community.
- Less expensive: Smaller homes are less expensive to purchase and less expensive to keep (insurance, taxes, heating, cooling, electricity, etc.).
- Easier to maintain: Dwellers are supposed to give amount of time, energy, and effort to maintain a big house. All things being equal, a smaller home requires less of your time, energy, and effort to accomplish that task and goes with the active routine of the urban people.
- Less environmental impact: A smaller home requires fewer resources to build and fewer resources to maintain. And that benefits the dwellers.
- Intimate and cosy: Promotes interactions and this gives each room, as well as the entire house, a feeling of cosiness and intimacy that larger homes lack. Also encourages family bonding. It's easier to focus on quality over quantity when it comes to the location and other facilities.
- Wider market to sell: By its very definition, a smaller, more affordable house is affordable to a larger percentage of the population than a more expensive, less affordable one.
- Energy efficient: Less space to heat and cool, which means lower ecological footprint. Hence minimize electricity cost.
- The Smart Cities Mission requires smart citizens who actively participate in the reform. Citizen involvement is much more than a ceremonial participation in development. Smart people involve themselves in the definition of smart the smart city, decisions on deploying smart solutions, implementing reforms doing more with less and oversight during implementing and designing structures in order to make the smart city developments sustainable.
- Indian urban people (other than metro cities) do not wish to live in a small house and traditional values therefore desire to fulfil the space pleasure and comfort. But if they get a house with various smart city facilities with an obligatory home space then the priority get shifted to the location. Location can also contribute to more stable housing values, critically important for households whose homes are their primary asset.
- Focusing on small house design is the civic duty of an architect in the democracy. Where everyone deserves a safe and well designed house to live and architects could provide these services with relevant furniture placement.
- Guidance for smart living with the efficient use of space with the multipurpose furniture.
- For organized, affordable house the planning, design and construction of 20 million dwelling units in next six years would not be possible in the current usual way. This would require innovations in land assembly and development, planning, design and construction. This is also a unique opportunity to introduce new concepts, such as digital planning, spatial data infrastructure for land management and utilization.
- The Smarter Small Home: The innovative affordable housing solution is the smarter home-type concept which should be introduced in the smart city planning. A highly livable and sustainable design must be encouraged in the society. It's livable because the multi-storey construction minimizes the building footprint without sacrificing inside living area and leaving a sizable yard for outdoor entertaining and activities. Inside, no space is wasted and many do 'double duty'.

## 7. SPACE MANAGEMENT: HOW IT CAN BE ACHIEVED

Every individual, regardless of their religion, culture or social stature, has one common dream – the dream of possessing his own house, an asset that he takes pride in owning. A smart city influences one's life in various aspects as shown in figure 2. After all, shelter is one of the basic necessities for survival. However, it is no surprise that acquiring a decent house in this day and age has become as difficult. In 2017, rents continued their years-long rise, incomes stratified further, and the average price to buy a home in major Indian cities rose. We can better understand how modern domesticity is globally disseminated.

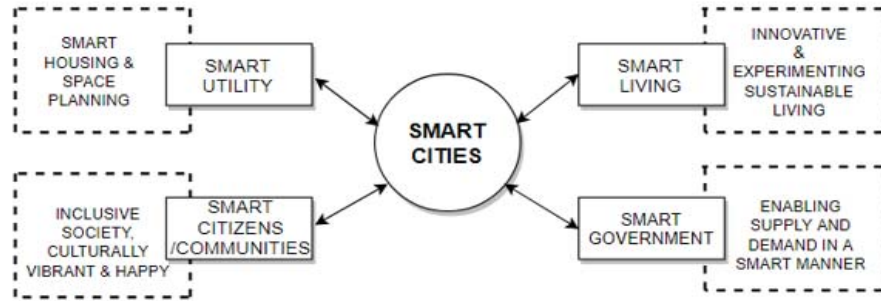


Figure 2: Stature of Smart Cities

## 8. HYBRID INNOVATIVE IDEAS FOR SPACE MANAGEMENT

In India, the Planners, Architects and designers are mostly responsible for policies, standards and actions in terms of master and building plans. Due to these standard values the user preferences are either ignored or the rationalistic values are authoritatively imposed. As there are strong relationship between values and urban form introducing new ideas with a practical approach is important. The following are ways to initiate some space management techniques:

- Mezzanine level: Mezzanine flooring can create additional floors of space for a variety of different uses such including storage or extra office space.
- Multipurpose furniture: Multipurpose furniture is the way to go for those with small spaces or who like to have everything in its place and a place for everything. These are suited for *use* in any space that values good design.
- High ceiling: It provides more space to install windows and bring in natural light, which minimize electricity consumption and adds a charming appearance. Low-sitting furniture will go a long way towards giving the feeling of greater space too and more real-estate on the walls.
- Storage: Shelves and storage spaces under staircase are the best tricks to use the area underneath the stairs.
- One standby of tiny house architecture is fold down furniture. This generally refers to desks and tables, though with a little imagination, an organized indoor space can be achieved.
- Practical space saving interior design: Use of Awkward Spaces. As custom shelves are not expensive and can be fitted into awkward spaces and nooks. A wall that juts out or an awkward corner can also be defined, consider custom shelves to fill the space.

- Use of wall efficiently: Providing wall shelves would be so much more efficient to store them vertically. As walls is a home's number one untapped resource.
- Internal Furniture partition instead of wall partition: By keeping unnecessary partitions out of it helps to make it spacious and more functional in all aspects.

## 9. CONCLUSION

To insure better living environment within the context of rapid urban population growth a new phenomena of smart city appeared. The purpose of this paper is to highlight the solutions of key challenges in urban development. And also ensuring benefits of smart city techniques in terms of affordable and smart living ideas.

Smart cities grasp new technologies and utilise existing and planned architectural concepts to provide a higher quality of living to each and every resident, a conducive investment approach to low income group by ensuring maximization of resource utilisation and transparency for governments. They can be considered as, smart architectural infrastructure; these systems work collectively so as to generate intelligent and actionable information for decision-makers.

## 10. FUTURE ASPECTS

This study is done virtually without any actual case study of a specific project. These dissertations will cover only interior spaces utilisation. As smart cities are developing for the development of its citizens, but focusing on the public spaces only does not fulfil the demand. Some definitional boundaries are required to guide cities in the Mission. In the Imagination of any city dweller in India, the picture of a smart city contains a wish list of all the essential facilities for a better lifestyle. Development lacks in terms of guidance to the people for their future growth and development. Thus architects and planner should come up with the new global concepts for the smarter and innovative lives of the citizens.

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