Planning for Smart Cities in the Indian Context

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Abstract

Smart cities are, in general, perceived to be high technology urban areas. They have been defined by many entities depending upon the business these entities are into. For example, organisations like IBM or Cisco talk about development of smart cities in terms of usage of Information and Communication Technology (ICT) to enhance the quality and performance of urban services such as energy, transportation and utilities in order to optimize costs and improve living standards. **Smart Cities Council** constituted by many organisations from US and Europe such as Alstom, GE, Microsoft, AT&T, etc. defines smart cities based on use of ICT for the enhancement of liveability, workability and sustainability. In the process, the basic fact that smart cities are perceived based on the state of development of a country and basic planning necessities have been completely ignored. The concept of smart cities varies from country to country and depends on the level of development and aspirations of citizens.

One should not forget that the Urban Planning principles prevailing in a country have evolved through centuries. While applying the planning principles defined by such entities, the conventional town planning concepts may get overlooked.

While planning for smart cities in India, often culture and traditions are the controlling and guiding principles for planning. Greater importance should be given to social culture than to the technology aspect alone. However, in reality, ICT applications take on a greater role than cultural heritage and economic factors. Success of smart cities will be judged by their ability to transform the lives of citizens and reduce the growing inequality in society.

This paper highlights the need to achieve a balance between the conventional way of developing smart cities and using modern technology, thereby preserving their cultural and economic identities.

Keywords: *Smart city, urban planning, census of India, ICT*

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1. Introduction

In prehistoric times, man was a nomad and largely depended on naturally available resources for his sustenance. After invention of fire and agriculture, he became socialised and started settling at fixed places giving rise to communities and cultures. It is common knowledge that human settlements in the past evolved along banks of rivers. Availability of natural resources had a considerable effect on settlements. Settlements continued to develop near water bodies till recent times. The industrial revolution that took place in the 18th century A.D. changed this concept of settlements near river bodies. This period witnessed a significant amount of migration on account of employment opportunities created by the industrial revolution. With the advancements in transport and other civic services like water and sanitation, people started inhabiting in other areas, which eventually grew into cities. Transformation of these areas into cities also brought in the need for infrastructure development. Soon cities became overpopulated for various reasons, and as a result, satellite areas around the cities developed, thereby exerting further pressure on the city's infrastructure and stress on social interactions. In some cases, this pressure reached saturation levels thereby necessitating further infrastructure development either by means of capacity expansion, capacity addition or replacement. Where none of this was possible, it was found necessary to use modern technology to raise efficiency / capacity of the infrastructure, thereby rejuvenating it. The last step may be seen as the impetus for the evolution of the concept of smart cities. This concept was evolved from the need of augmenting / managing existing infrastructure, safety and security and social interactions. To achieve modernization / infrastructure augmentation, using technology became an essential part of the planning principles of these cities.

1.1 Conventional cities and smart cities:

Conventionally, a city is defined based on population or extent of infrastructure available to the citizen. Census of India defines a city as an urban area having a population of more than 100,000. However, the cities of olden times were actually places of importance either because of trade or pilgrimage or political reasons. These activities naturally led to the development of infrastructure in places of importance, irrespective of the level of population. So, it was the culture and economy of an area that designated it as a city, and not the population or infrastructure. The definition of a city as per the Census of India takes into account neither the economic condition, nor the cultural importance of the city.

As regards smart cities, attempts have been made to define a smart city on a similar set of infrastructure-based parameters. Some of the definitions of a smart city by different agencies are as mentioned below –

Smart Cities Council defines a smart city as one that "uses information and communications technology (ICT) to enhance its liveability, workability and sustainability."

CISCO defines smart cities as "those which mitigate the challenges posed by the increasing population and rapid urbanization, through adoption of scalable solutions that take advantage of Information & Communication Technology (ICT) to increase efficiency, to reduce costs and enhance the quality of life."

In the approach of the Smart Cities Mission, the objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'smart' solutions. The focus is on sustainable and inclusive development and the idea is to look at compact areas to create a replicable model for other aspiring cities. It is meant to set examples that can be replicated both within and outside the smart city, catalysing the creation of similar smart cities in various regions and parts of the country.

In both conventional and smart city strategies, more focus is given to population growth and infrastructure requirements to cater to the needs of the population.
In a diverse view, along with the above parameters, one should also consider the uniqueness or culture of different cities, towns or localities. In Prime Minister Modi's words, "Every city has a distinct identity and country's people who are the smartest should decide on how to develop urban spaces."

The concept of smart cities must be seen in the Indian context and without the biases of techno-centrism and one-size-fits-all solutions.

We have examples from Indian smart cities that have incorporated cultural and historical aspects in their development strategies.

2. Planning Principles for Conventional Cities

The word 'city' is derived from the Latin word '*citatem*' and originally meant a 'community of citizens'. The conventional or traditional way to define a city includes growth accentuated more on basic settlement principles like workability, connectivity and diversity, traditional neighbourhood structure, sustainability and safety. This leads to benefits to residents, business, developers and the government.

In view of the above, the following basic planning principles are being traditionally followed for development of urban areas:

- Connectivity - How a place is connected to its neighbourhood and different zones of activities within and outside the city.
- Accessibility – Providing for ease, safety and choice when moving to and through places.
- Provision of enough open and public spaces to promote public activity / public interactions.
- Shaping places to support their varied intended uses.
- Complementary mixed uses – Locating activities to allow constructive interaction between them.
- Character and meaning – Recognizing and valuing the differences between one place and another.
- Continuity and Change – Locating people in time and place, including respect for heritage and support for contemporary culture.

Although many other principles of planning for a city can be articulated, the main focus of planning is on improvement of the quality of life of people living in the city and provision for future expansion.

Though cities were planned using the above principles, a large number of people migrating to the city often encroached upon the planned areas / facilities, thereby making it look like a haphazard / unplanned urban locality.

3. Planning Principles for Smart Cities

Robinson (2015) recommended twenty three principles to be considered for planning a smart city. These principles mainly include designing a city to accept new technologies. In the process, he also recommends the use of media and social tools to a great extent which means, technology leading to virtual interaction between people.
However, a smart city is a relative concept that varies according to country, time and institution that operates in this area.

The Smart Cities Council (https://smartcitiescouncil.com) is a body promoted by organizations in the business of specialized technologies comprising information and telecommunication. While it does not recommend any principles to be followed for planning of smart cities, it does give recommendations on smart solutions for a city to make it smart. These solutions are in the areas of water and sanitation, energy, public transport, safety and security, public health and finances, etc. If one has to derive principles of planning based on the recommendations of Smart Cities Council, the focus will primarily have to be on incorporating technologies that are scalable and resilient, and lead the city to substantial automation of infrastructure services. Such high level of automation may sometimes lead to failure of the city as a 'smart city' as the citizens may not be ready for accepting the same.

Smart city mission of the Government of India has laid down the essential features required for a city to be eligible for 'smart city' status. One of the features is to provide core infrastructure that includes:

- Adequate water supply
- Assured electricity supply
- Sanitation, including solid waste management
- Efficient urban mobility and public transport
- Affordable housing, especially for the poor
- Sustainable environment
- Safety and security of citizens, particularly women, children and the elderly
- Health and education
- Good governance, especially e-Governance and citizen participation
- Robust IT connectivity and digitalization

Thus, the smart cities mission aims at the basic infrastructure required in a city to make the life of citizens liveable and workable.

Other features envisaged are –

- Mixed land use in area-based developments
- Housing and inclusiveness - housing opportunities for all
- Creating walkable localities to reduce congestion, air pollution and resource depletion
- Promote interactions and ensure security
- Necessary administrative services are offered within walking or cycling distance

It may be seen here that most studies and recommendations of organizations focus on infrastructure and ICT in their guidelines for new cities. Smart Cities Mission, India, does recommend implementation strategies like retrofitting, redevelopment and pan-city development for converting a conventional city to a smart city; however, it does not explicitly bring out the cultural /social aspects when providing smart solutions.

Thus, there are no clear-cut guidelines for planning to convert a city, having good amount of heritage or cultural background, into a smart city. It appears that this is left to the judgement of the individual city development organizations to factor the same in their plans.

4. Smart City Planning Principles to Suit Indian Conditions:

There is great variation in cultures and lifestyles of citizens in India according to geographic location, climatic zones and historical context. Overspill of population in the cities over time has resulted in development in a haphazard manner, which, in turn, has resulted in lack of open spaces, sanitation and waste management. These conditions prevail especially where cities have great heritage or cultural background. While the smart city mission aims to correct these irregularities, it may not always be possible to correct these given the historical/cultural backdrop.

In this backdrop, let us look at examples of smart city plans for a few Indian cities that have rich cultural heritage and draw lessons on how these can be used to create blueprints for a smart city.

Example 1: Solapur

Solapur, Maharashtra is known for its traditional textile industry producing the trade-marked *Solapur Chadder* – known throughout India for its unique style. Solapur City is now being developed as a smart city and is undergoing transformation through augmentation of its physical infrastructure and application of smart solutions in the field of energy, water supply and solid waste. The vision for the smart city is "Solapur: Clean, Efficient and Progressive". While basic infrastructure is the need of the hour at Solapur, at the same time, reviving the traditional industry or weaving in the current cultural context should also be part of the development plan.

Example 2: Nashik

Nashik, which is situated on the banks of River Godavari, is an important place of pilgrimage, especially due to the *kumbh melaa* that is held every twelve years there.

The vision for Nashik Smart City talks about blending of tradition and modernism -

"Nashik provides a blend of tradition and modernism as it strives to be one of the leading cities in India to live, work and play. It provides city living at its best, with convenient and affordable public transport, safe and sustainable civic services and a responsive local government. Nashik chooses to preserve its cultural heritage while creating a sustainable future."

While the vision talks about preserving the heritage, the key focus of Area Based Development Plans is again on specific infrastructure elements only viz., roads, water supply and sewerage network. As a result, Nashik, as a smart city, has undergone tremendous transformation in the physical infrastructure and during the last *kumbh melaa* held in 2015, ICT was applied to manage the visitors, traffic, management of solid waste, sanitation, water supply, electricity supply, etc. Residents of Nasik continue to enjoy the ICT improvements even after the closure of the *melaa*.

Example 3 Ujjain:

Ujjain is one of the oldest cities in the world. Its illustrious history documented in Puranas, epics and treatise bear testimony to the fact that it was a smart and prosperous city in ancient India, recognized for its cultural, political, commercial and educational capital. Ujjain was prosperous (Unnat) as a trade centre of Koshambi-Paithan route joining North and South India. It needed to be revitalized smartly for the city to reclaim its foregone economic glory, yet keep pace with the modern digital economy. In this context, Ujjain Smart City Limited (a special purpose vehicle constituted by the state government to implement Ujjain's Smart City project) has the following apt vision - "A sustainable religious tourist destination taking forward the ancient heritage…". On looking at the development plan, one key aspect that stands out is factoring in the development plan of the existence of the Mahakal Temple – one of the most ancient and sacred pilgrimage destinations and also the fact that there is a highly fluctuating visitor population (depending on festivities). Ujjain Symbiotic City (USC) Area Based Development (ABD) covers 2 key areas viz, Mahakal Area and Mill Area covering around 1,023 acres. The ABD synergizes two symbiotic nodes – first, the "Mahakal Area" as a Religious and Cultural Hub (RCH) for revitalization of the tourism experience, and the "Mill Area" to be developed as Knowledge and Economic Hub (KEH) to nurture diverse knowledge based economic activities, efficiently served by Multi-modal Transit Hub (MTH) in "Railway Station Area" connected by a bus based Transit Corridor. The ABD proposed to combine intelligent regeneration of the historic core, temples, markets, riverfront, lakefront and public spaces with the redevelopment of the mill area for creating compact, mixed-use and sustainable neighbourhoods. The plan seems to be factoring both aspects towards ensuring that Ujjain strengthens its religious tourism-based economy while providing an alternative knowledge based economic base for its citizens.

Hence, while taking care of the population in the plans for a city, the cultural / economic activities should also be given equal weightage. This will help maintain the cultural / traditional aspect in the smart city irrespective of the level of technology. A smart city may not essentially be a city with a lot of ICT deployed, but it has to be rather a township or a walkable community where people have their work places close to their dwellings, can satisfy most of their needs within the township and most importantly, feel safe within the township. Planning should be integral, holistic and not siloed or piecemeal. Holistic planning will result in enjoying basic parameters of planning such as travelling a short distance to one's work place, satisfying basic requirements from within the localities and socio-economic aspects that ultimately help the city environment by reducing the burden on the city infrastructure leading to reduced pollution, spatial requirements and less usage of resources. Smartness in functionality, usage, energy consumption ultimately promotes a smart ecosystem.

Thus, we may summarise the three main aspects of planning for smart cities as -

- Township and not metropolis
- Holistic and not piecemeal
- Not only population-based but also activity-based and cultural heritage based

Development of smart cities, hence, is rather a re-planning / urban renewal program rather than deploying of piecemeal technology tools. The objectives of such programs are to add suitably to the civic aesthetics of the city, to correct the past errors as far as possible, to drive economic growth, and to develop healthy, attractive and efficient environment to manage future growth. All the above objectives could be well achieved under the umbrella of ICT. These principles are also applicable to greenfield smart city development; however, such greenfield development may be more technology-centric rather than people-centric as is the case with GIFT smart city near Gandhinagar, Gujarat.

A typical flow chart for smart city planning is presented in Figure 1:

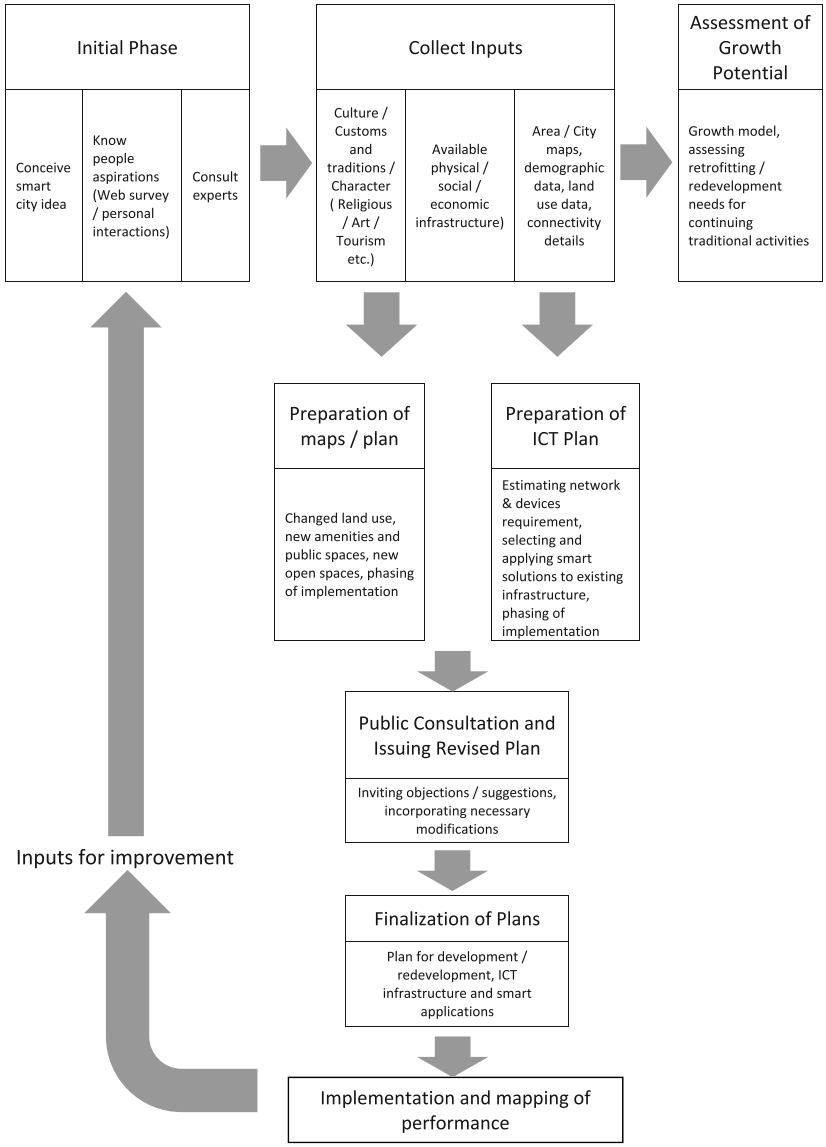

Figure 1: Typical Flowchart Showing Planning Process for a Smart City

5. Conclusion

Technology should be used judiciously. It should not do away with the traditional aspects of the city. Planning strategies with the help of technology should focus more on preserving cultural and historical values associated with a city. Physical infrastructure planning should promote mixed land use pattern, more convenience, open public spaces and walkable communities. Use of technology should facilitate enhanced safety and security, better health amenities, education and higher public interactions through recreational and cultural events.

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