A COMPARATIVE REVIEW TO ASSESS THE ROLE OF DIGITALISATION IN BUILDING SMART CITIES

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INTRODUCTION

A smart city is a modern urban area that utilizes information and communication networks to uplift the standard of living and create a sustainable economy. Initially the smart city concept referred to "initiatives that use digital and ICT-based innovation to improve the efficiency of urban services and generate new economic opportunities in cities."

However, based on the varying countries and institutions, the definition of smart city is subject to debate and controversy. Though, the initial idea of these initiatives focuses on digital innovation to improve the standard of living and improve the competitiveness of society.

Thus, the OECD defines smart cities as "initiatives or approaches that effectively leverage digitalisation to boost citizen well-being and deliver more efficient, sustainable and inclusive urban services and environments as part of a collaborative, multi-stakeholder process" (OECD, 2018a).

Thus, the definition focuses on four main areas of concerns

Smart Cities Mission, launched on June 25th, 2015, aims to utilise smart solutions to develop cities that provide core infrastructure, suitable environment and a good standard of living for the citizens. It is a Centrally Sponsored scheme with a financial support of upto INR 48,000 crores over 5 years. 100 cities across the country have been chosen to be developed in this mission through a two-stage competition.

While there is no single definition for the term Smart City, there are 6 core principles that are the pillars of the Smart City Mission in India. They are as follows-

1. The community is central to the planning and development

2. Using less resources to attain great outcomes and impact

3. Maintaining cooperative and competitive federalism

4. Integrating innovative and sustainable solutions

5. Using technology as means, not a goal

6. Inclusive of individuals from all backgrounds

This review paper aims to understand the role of digitisation in the Smart Cities Mission through a comparative study of smart city definitions and budgets allotted to three major sectors that are transportation, energy and infrastructure(housing). With the distinctive role of digitisation in smart city development, this paper will highlight the emphasis and effectiveness of technology in the Mission.

REVIEW OF LITERATURE

OECD

The "smart city" concept initially referred to initiatives that use digital and ICT-based innovation to improve the efficiency of urban services and generate new economic opportunities in cities. With the proliferation of smart city initiatives around the world, greater attention needs to be paid to whether the benefits and costs of smart cities are spread across all segments of society, i.e. assessing the distributional effects of smart cities on people, planet and places. Based on the discussions that took place during the first session of the 1st OECD Roundtable on Smart Cities and Inclusive Growth, this section will: (i) review existing definitions of smart cities and propose a possible typology of smart cities; (ii) present a SWOT analysis of smart city initiatives in OECD countries; and (iii) discuss the role that national and sub-national governments play in smart cities and inclusive growth.

Smart Cities: CPR India - Pg10- Budgets of Development Sectors

The newly elected federal Government of India (GoI) launched the Smart Cities Mission (SCM) in 2015 with the stated purpose of improving the governance and infrastructural deficiencies that plague Indian cities. The Mission categorically states that there is no one definition of a 'smart city' and implies infinite liberty for cities to self-define their understanding of 'smartness'.

Towards demystifying the Mission, the researchers utilised government documentation from the 99 cities to answer one question – What constitutes a smart city in India?

Smart Cities Mission in India - Pg54- Figure 5- Components of a Smart City- Basic Infrastructure

Increasing urbanisation globally has led to rethinking of the urban practices and policies by governments and professionals alike. The concept of Smart Cities is one such path that many nations are taking by adapting smart solutions and smart technologies in order to deal with the changing urban landscape. The Smart City agenda has very quickly emerged as a potential riposte in order to tackle the myriad of issues that urbanisation is posing. India too has stepped onto a similar direction and has launched an ambitious programme of developing 100 Smart Cities in 2015, in order to deal with the challenges of urbanisation. While announcing the launch of this mission, the current Prime Minister, Mr. Narendra Modi said that this mission would end the top-down approach that the Indian cities have faced, and would lead to people-centric urban development where the city leadership would have the possibility to decide how their city should grow. This is precisely the entry-point for this research to critically assess if at all the Smart cities mission would be able to realise the long required decentralisation efforts that have been pending and give cities the sovereignty to decide on their own urban development trajectory. The mission guidelines define the regulations to prepare and implement smart city proposals by the 100 selected cities and the mechanism to do that is by setting up a separate Special Purpose Vehicle for each city. This research is focusing on the implementation process in order to understand the impact the mission would possibly have on the local governance structures by taking up two cities, Bhubaneswar and Kochi, as case studies. There are multiple actors and stakeholders who have been and would be involved in the Smart Cities mission in India and the case studies assist in listing them down and identifying the inter-linkages between them. Instead of laying a roadmap to empower local governments and incentivising state governments to support cities with increased capacity, faster decision-making processes, and increased autonomy, the Smart Cities mission seems to have taken the easier way out. While the Smart City proposals were prepared by the city governments with the assistance from consultants, the projects under these proposals would be planned and implemented by the Special Purpose Vehicles, which would be constituted as separate companies. Such an arrangement appears to go against the very idea of decentralisation and empowerment of local governments. By using Bruno Latour's Actor-Network Theory as an analytical tool to visualise the human and non-human actors involved in the planning and implementation of Smart Cities mission, this research

attempts to reconnoitre the impact that the Special Purpose Vehicles would have on the overall urban governance scenario of India.

DISCUSSION

To assess the parameters and their effectiveness in smart cities of India

A comparison in the CPR Smart Cities Database, 2018 with the parameters of Smart Cities Projects globally.

The smart cities mission in India defines a smart city as a city that works for the people and meets their demands. A general definition of such cities cannot be deduced as each individual's version of a smart city, based on their needs, will be different. Accordingly there are two kinds of factors that attract people to a particular city, they can be classified as push and pull factors. The push factors are often stressors, problems or obstacles such as unemployment, floods and violence that force people to relocate. The pull factors can include a city's infrastructure, work opportunities, education that encourage people to move towards them.

Smart City Mission- gov.in - Pg18

Meijer and Bolívar have identified four typical conceptualization of smart city governance – i) government of smart city, ii) smart decision-making, iii) smart administration, and iv) smart urban collaboration (Meijer and Bolívar, 2016: 398)

Discussing 3 Sectors of the Smart City Mission

Transportation

Transport is the essence of each city, be it for cargo, passengers or animal stocks. The networking of a city makes it more accessible and convenient for the people living there. While there are various modes of transport to travel across the world, the good connectivity is beneficial in improving the standard of living by ease in travelling, cost reductions and cleanliness, in general. Introducing better infrastructure and systems to the transport sector will also allow a better flow in traffic, reduction in personal vehicles and even save time through smart ticket systems.

Smart transportation also known as Intelligent Transport Systems is used in every form of transportation from cars, airplanes, boats to trains. The focus of smart transportation is on various types of navigation and communication systems in all forms of transport. Smart

transportation systems across the world have allowed the construction of intercity railway networks, protected pedestrian paths and cycle routes, global airway hubs, among others. ITS helps individuals easily choose between different transportation methods, cost-effective tickets, etc.

According to the CPR Smart Cities Database, 2018, the transportation sector has a proposed budget of INR 32,600 crore which is about a quarter of the entire budget divided across the 60 cities. In this budget, the highest emphasis on the IT component has been placed in this sector, with a great focus on traffic and information systems.

Thus, a great amount of emphasis is being given to digitalization in the transport sector in Indian cities. The mission is also largely focused on supporting motorised transportation systems while only a 13% focus is on non-motorised vehicles. The major implementation of the budget is on road travel and safety, out of which only a minute portion is dedicated to public transportation. It can be concluded that despite the aim of the mission being sustainability, the transport sector is working towards improvement for owners of private transportations.

Energy

Energy, in simple words, can be defined as the ability to do work. The law of conservation of energy states that energy cannot be created or destroyed. It can simply be transformed from one form to another. Thus, energy can be found in various forms such as kinetic, thermal or chemical energy to name a few. Other than the traditional forms of energy, the modern world has started to associate energy with other terms including green energy, sustainable energy, renewable energy etc. The presence of these new terms has been apparent in the past few years due to the fear that energy sources are being rapidly depleted and will be completely utilized in the next few years. They are also an encouragement to care for the environment by making a minimal negative impact through clean energy consumption.

Smart energy is a concept that is different from any other form of energy. The concept of smart energy can be viewed as a model of the Internet of Energy. This model is based on the principles of smart consumption, smart power grids and better generation, etc. In simple terms, it can be said that combining any form of energy, traditional or otherwise, with information and communication technology (ICT) becomes smart energy.

A smart energy system has three independent yet essential components; decentralized energy sources, efficient distribution and optimized power consumption. Green energy, bio-gas, wind and solar energy are a few forms that can be used as sustainable energy in the smart energy

system. Using smart grids, infrastructure and meters paired with an appropriate level of utilization of the information and communication technology can help with effective distribution.

ICT can be used to manage the energy consumption of electric products efficiently.

This sector has been provided a budget of INR 22535.8 crore paired with ecology. The focus of this funding is on energy-based projects including metering, distribution and renewable energy, constituting 23.3% of the budget allotted. The IT part of this project comes from the meters, poles and allied projects. Thus the major variable in the energy sector is supply and distribution of energy while meters, poles and renewable energy have a smaller budget.

Infrastructure/ Housing

An infrastructure of a city can be defined as the basic organizational structures and facilities such as roads, transport systems and buildings. For a city, society or enterprise to operate, a strong infrastructure is required.

A smart infrastructure, on the other hand, can be defined by anything digital, physical or electrical that is essential for the functioning of the smart city. The ICT infrastructure comprises service-oriented information systems and communication systems such as fiber optics, wireless hotspots etc. The middleware, one of the major components of smart infrastructure, is a type of software that is essential for automation and functioning of a smart infrastructure.

Smart buildings including housing, offices etc are a part of smart infrastructure. A smart building comprises different hardware, software and appliances to guide automated operations such as surveillance, power management and voice-over-IP.

However, smart buildings are often correlated with green buildings, though the two concepts are very different. The concept of a smart building is broader with its ability to connect to other buildings, people and locations.

While the main focus of smart infrastructure and buildings is on the technology component, the smart cities mission does not entirely focus on that. The definition of infrastructure, especially housing, according to the smart city mission, aims at real-estate development, having devoted half of the projects to it. In India, housing has been the main focus in infrastructure and has been given its separate budget. The housing sector is the third largest development category within the budget of INR 16381.2 crore. As mentioned before, 0.2% of the total projects with the IT component have been allotted in the budget. Thus, the mission has a minute focus on

technological development of the housing or infrastructure sector. The initial focus of the project stays limited to redevelopment which is also essential for the Indian economy.

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