Development and Challenges of Smart Cities in India

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ABSTRACT:

The concept of a Smart City' with enhanced technological strength is being discussed at various places of the world. India also took various initiatives in this regard and made significant progress. The way smart city initiative is rolling out in India with its own socio, political and economic dimensions. In this context, the paper takes up some of the perennial questions of smart city building in India and attempts to have comparative case studies of other related experiences beyond India. The paper focuses on the advantages and disadvantages of smart city ide and also analyses the issues and challenges involved in the process. The research also dwells on some of the possible policy solutions regarding smart city management. India also is all set to become an urban majority nation by the mid–twenty–first century. Most of India's urbanisation seems unplanned and mismanaged leading to a host of social problems like slum extensions, social exclusions, absence of basic accessibilities with the widespread prevalence of social injustice and the process has been majorly attributed to migrants from rural areas. Post–independence plans exhibit several instances of correcting congestions in India's big cities through the creation of alternate absorption points. With this background in mind, the paper goes on to argue that, the urbanisation of mid–sized cities have proven to be mostly unimpressive, failing to relieve the big cities, thereby generating a top–heavy structure. It further finds, through an extensive content analysis that the Smart City Mission was introduced to rid the Indian cities of its long–pending issues by enabling big cities to accommodate better and most importantly empowering mid–sized cities to emerge as centres of growth. However, following the tradition of a certain kind of project–based urbanisation; the mission appears to have inherited vulnerabilities like hierarchical power structures, inadequate local bodies, the dependence of private players, exploitative market forces and inter–group and inter–spatial conflicts from its predecessors like the JNNURM. Undoubtedly, the intent has been to learn from the past but the basic federal structure of governance.

KEYWORDS:

Technological, Dimensions, Urbanisation, Hierarchical.

Introduction:

A smart city effectively serves its people by continuously evolving to meet their needs and aspirations. At its core, a smart city aims to enhance the quality of life for its residents by providing efficient services, robust infrastructure, and a sustainable environment. Smart cities thrive on understanding the unique factors that attract people–whether it's economic opportunities, cultural richness, educational institutions, or health facilities. By focusing on three key pillars–liveability, economic–ability, and sustainability–a smart city ensures access to housing, transport, education, healthcare, and recreational facilities, tailored to the diverse needs of its inhabitants. Ultimately, smart cities are dynamic urban spaces that support and shape the lives of their people.

Across the world, the stride of migration from rural to urban areas is increasing leaps and bounds. By 2050, about 70 per cent of the worlds population will be living in cities and towns and India is no exception. With more than 75 years of independence (Azadi ka Amrit Mahotsav), India contributes to providing its citizens with a better quality of life and better services. Smart City Mission (SCM) is one of the flagship scheme (25th June, 2015) by the Central Government of India under Ministry of Housing and Urban Affairs (MoHUA) for the development of 100 cities with the mission of driving the economic growth and improving the quality of life urban dwellers in the aspects of E–Governance, pure drinking water supply, transportation, entertainment, safety and security, delivery of govt services, water management etc. In smart city, there is use of digital technologies to enhance the quality of life and standard of living of its citizen. A city can be defined as Smart when a wise management especially through ICT– based technology, sustainable and inclusive development of city for all urban dwellers for sustaining of high quality of life. By smart, we mean that the city is more sustainable, efficient, and liveable for all urban dwellers. The term Smart city has been introduced in the year 1990s, however only in mid 2010 this concept has bloomed and through discussed t by Town Planners, Academician, Administrators, Urban Geographers, Regional Planners, Economist, etc. Another name of Smart City is Digital City or Wireless City or Future City. Today the concept of smart city is viewed as a vision, manifesto or promise aiming to constitute the 21st century sustainable and ideal city form. The Smart Cities Mission is an innovative and new initiative by the

Government of India to drive economic growth and improve the quality of life of people. 100 smart cities would easily bring crores of Indian citizens under smart and transparent e Governance and improve their lifestyle easily. This wonderful project will help to reduce poverty,

The Ministry of Urban Development had identified 24 key areas that cities must address in their 'smart cities' plan. Of these 24 key areas, 3 are directly related to water and 7 are indirectly related to water – Smart–metre management, leakage identification, preventive maintenance, and water quality modelling. Smart Cities Mission is one of the mechanisms that will help operationalize the nationwide implementation of the Sustainable Development Goals (SDG) priorities like poverty alleviation, employment, and other basic services. The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries – developed and developing – in a global partnership. They recognize that ending poverty and other deprivations must go hand–in–hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

Review of literature:

Joshi, Saxena and Saksham (2016) studied an integrated framework of developing smart cities of India. The researchers discussed the problems with growing population and fast urbanization can be tackled only through the concept of smart city. A smart city is a futuristic approach which ensures optimum use of limited resources, make cities more proficient, sustainable, and livable. Researchers identified 6 important pillars which can help smart cities initiative a successful project {SMELTS}. Detailed study of it will help the government in smart governance, and to achieve it managerial implications. Researchers pointed those major issues of smart city like Project Size, Multiple Goals, Social Challenges, technological, Economical Challenges, Climate Distortion and many more can be solved only when we shift from technology to established smarter system which can enhance the use of resources.

Varghese Paul (2016) in his work "Exploring Other Concept

of Smart– Cities within the urbanizing Indian context" has focused on the concepts of smart cities within the Urbanizing Indian context. With rampant increase in urbanization, he highlighted the current realisms of first proposed smart city of India – Dholera and its developmental issues. The researchers also explained the model of smart village proposed by Dr. A. P. J Abdul Kalam. He explained how the first smart city already experiencing a teething problems. In the expedition to develop the new green field scheme – Dholera has already run into issues where the local population is not taken into confidence, they were least informed of Dholera as SIR. There are many parameters on which country is lacking in developmental process, rather than focusing for solving wider ranger problems government must try to look at narrow solutions and try to jump ahead of the possibilities.

Soni Nupur (2020) studied a review and analysis of smart city in India. The researchers focused on smart city mission in India along with key components, advantages and disadvantages. By highlighting the building blocks of smart cities she also explained how smart cities will provide several benefits if Intelligent Technology is included in human life. Along with this, she also mentioned how these technologies will not fix basic urban problems and data of every action is collected and monitored and measured can be considered as intrusion of privacy. Smart city mission is an innovative and new initiative by the government of India to drive economic growth, improve quality of life and harnessing technology as a means to create smart outcome for citizens. She observed that how urban people will start demanding of intelligent cities with sustainable environment and higher quality of life focused on the infrastructural development for the smart urban development in India. They pointed out the need of establishment of parameter particular to Indian standard for development of smart cities. They analyzed major initiatives taken in service delivery across India. The researchers focused on concise comparison of smart city development on global scenario. Consideration of different factors, parameters expressed that urban development is a complex process in different dimension and evaluation. India barely paid attention to its urban transformation. India needs to build infrastructure on grand scale to meet the need of their because smart cities promise social, environmental, economic sustainability. By 2030 all major cities of the world will be on the path of becoming smarter.

Kunkulol and Waghmare and Ashish (2016) discussed the development and progress of smart city in our country. The researchers advocated that urbanizations and its accelerating expansion led the present government to build a robust infrastructure at the forefront agendas. They prepare outlines of opportunities landscape for smart cities. To support Indian government initiative, they enable as solution providers to take standard of current situation. After short listing of cities on economic criteria and geographical inclusivity they focused on questions like What, How, Where, When and conditionality of smart cities. They pointed at the implementation stage of smart city in India like GIFT City, Wave City – IBM based, Lavasana City, Palava City and the key features of these cities covered under bilateral technical collaborations. They also focused on Varanasi Kyoto Agreement and observed that how India has become attractive Investment Destination. They analyzed that technologies utilizations of modern management system and PPP are key for success of such projects. They suggested that smart city valuation framework should be developed for cities interested in a inclusive and realistic development process.

Objectives of the Study:

The main objectives of the studies are

1. To study the concept of smart cities.
2. To study the key areas for the development of smart cities.
3. To explore the challenges faced during the development of smart cities

Database and Research Methodology:

The entire research work is based on secondary sources of data. The data has been collected from the Ministry of Housing and Urban Affairs, the Government of India, various Newspapers, Journals, Books etc.

Components of smart Cities:

Components of Smart City:

Smart Buildings: Availability of ICT Infrastructure, Housing Quality, Albedo control, Green Building, Efficient building and homes, Affordable housing especially for the poor.

Smart Environment:

Attractive natural conditions, less pollution, environmental protection, sustainable resource management, Smart Wireless cable, Sustainable Development.

Smart Energy:

Solar Energy, Smart grid, Smart Electric metering, Gas distribution and renewable energy, Efficient Solid Waste management, managing energy consumption, Adequate Electricity Supply.

Smart Public Services and IT Communication:

Features of Smart City: Public Safety, Healthcare, Education, Smart Traffic Control System, Reducing crime rate, Adequate Clean Water Supply, Water Resource Management, Smart Medical Treatment, Smart Disaster Management, Citizens Participation, Safety and Security of citizens particularly women, Child and Elderly, Provide best medical treatment and Education facilities, Women Empowerment, Robust IT connectivity and digitalization, Artificial Intelligence.

Smart Transportation:

Local accessibility, Sustainable, Innovative and Safe transport System, Electric vehicles, CNG– used vehicles, Improve Walkability and Cycle Paths.

Smart Governance:

Digital Birth and Death Certificates, Building Plan Approval, Utility Bills, Property Tax, E– Procurement, Personnel Management, Good Governance especially EGovernance, Transparency, Accountability and Opportunities for participation in government.

Challenges for smart city :

1. Trofitting existing legacy city infrastructure to make it smart:

There are a number of latent issues to consider when reviewing a smart city strategy. The most important is to determine the existing city's weak areas that need utmost consideration, e. g. 100–per–cent distribution of water supply and sanitation. The integration of formerly isolated legacy systems to achieve citywide efficiencies can be a significant challenge.

2. Financing smart cities:

The High Power Expert Committee (HPEC) on Investment Estimates in Urban Infrastructure has assessed a percapita investment

cost (PCIC) of Rs 43, 386 for a 20–year period. Using an average figure of 1 million people in each of the 100 smart cities, the total estimate of investment requirements for the smart city comes to Rs 7 lakh crore over 20 years (with an annual escalation of 10 per cent from 2009–20 to 2014–15). This translates into an annual requirement of Rs 35, 000 crore. One needs to see how these projects will be financed as the majority of project need would move through complete private investment or through PPPs (public–private partnership).

3. Availability of master plan or city development plan:

Most of our cities don't have master plans or a city development plan, which is the key to smart city planning and implementation and encapsulates all a city needs to improve and provide better opportunities to its citizens. Unfortunately 70–80 per cent of Indian cities don't have one.

4. Financial sustainability of ULBs:

Most ULBs are not financially self–sustainable and tariff levels fixed by the ULBs for providing services often do not mirror the cost of supplying the same. Even if additional investments are recovered in a phased manner, inadequate cost recovery will lead to continued financial losses.

5. Technical constraints of ULBMost

ULBs have limited technical capacity to ensure timely and cost–effective implementation and subsequent operations and maintenance owing to limited recruitment over a number of years along with inability of the ULBs to attract best of talent at market competitive compensation rates.

6. Three–tier governance:

Successful implementation of smart city solutions needs effective horizontal and vertical coordination between various institutions providing various municipal amenities as well as effective coordination between central government (MoUD), state government and local government agencies on various issues related to financing and sharing of best practices and service delivery processes.

7. Providing clearances in a timely manner:

For timely completion of the project, all clearances should use

online processes and be cleared in a time–bound manner. A regulatory body should be set up for all utility services so that a level playing field is made available to the private sector and tariffs are set in a manner that balances financial sustainability with quality.

8. Dealing with a multivendor environment:

Another major challenge in the Indian smart city space is that (usually) software infrastructure in cities contains components supplied by different vendors. Hence, the ability to handle complex combinations of smart city solutions developed by multiple technology vendors becomes very significant.

9. Capacity building programme:

Building capacity for 100 smart cities is not an easy task and most ambitious projects are delayed owing to lack of quality manpower, both at the centre and state levels. In terms of funds, only around 5 per cent of the central allocation may be allocated for capacity building programs that focus on training, contextual research, knowledge exchange and a rich database. Investments in capacity building programs have a multiplier effect as they help in time–bound completion of projects and in designing programs, developing faculty, building databases as well as designing tool kits and decision support systems. As all these have a lag time, capacity building needs to be strengthened right at the beginning.

10. Reliability of utility services:

For any smart city in the world, the focus is on reliability of utility services, whether it is electricity, water, telephone or broadband services. Smart cities should have universal access to electricity 24×7; this is not possible with the existing supply and distribution system. Cities need to shift towards renewable sources and focus on green buildings and green transport to reduce the need for electricity.

Future prospects and suggestions:

India is planning for 100 new smart cities and will also develop modern satellite towns around existing cities under the Smart City program. The need for infrastructure development in India is unquestionably vast. However the sector faces a number of fundamental challenges, including need for new long term investors participate in funding projects. There are two parts of the development of a Smart

City: Infrastructure (Communication, electricity, roads, Sanitation, Water assets among others) and real estate. In India, the foreign ownership and investment regulations for infrastructure and real estate are different. The government should consider classifying most Smart City development as "Infrastructure" to start with, such that for a Smart City development and same ownership, financing and taxation regulations apply to both the parts of the development. The Government is concentrating on encouraging Public Private Partnership (PPP) for successful implementation of the smart city project in India Financial and IT services sectors are on the priority list of the government to garner investments from leading companies such as Cisco, EMC, GE, IBM, Bajaj etc. in coming years. The real challenge before the Government is to build inclusive Smart Cities for all its residents, regardless of whether they are rich or poor. The big challenge will be to create self–sustaining cities, which create jobs, use resources wisely and also train people.

Conclusion:

India's Smart City program hopes to revolutionize city life and improve the quality of life for India's urban population. Smart City would require Smart economy, bright people, Smart organization, Smart Communication, Smart engineering, Smart transit, fresh environment and bright living never the less, with mass migration leading to basic problems, like water shortages and overcrowding, the rate at which these cities will be developed will be the key. Several initiatives are being led by the Government of India to convert 100 cities into Smart Cities. Government to actively use PPP Route and Encourage FDI for Effective Implementation of Smart Cities Project in India. India has to now take important decisions in the context of creating Smart Cities. It has to determine if it desires to opt for making new cities or upgrade existing ones.

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The Authors have no conflict of interest to declare that they are relevant to the content of this article.