Smart Cities Mission

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ABSTRACT

The National Smart Cities Mission was launched by Government of India in 2015 which is a redevelopment program with the aim to develop smart cities across the country and make them sustainable. This study examines how the Smart Cities Mission was implemented by The Union Ministry of Urban Development while collaborating with the state governments. It explores about the budget of the Mission, the engagement of the mission in different cities, the sustainability measures integrated and the future of the mission.

It analyses the challenges faced, technological integrations involved and the funding models of the mission. Moreover, the research focuses on the comparison of the smart cities mission in different cities, how different states have worked on it and what has been the perception of the public.

Furthermore, looking ahead to developing technology, the mission's lessons learned, and the dynamic nature of urbanization, the research also takes into account future viewpoints.

Keywords: Smart Cities Mission, Implementation, Governance, Engagement, Development.

RESEARCH METHODOLOGY

A blend of primary and secondary research has been conducted in producing this research document. Plethora of articles, books, research documents and journals have been put into view, analysed and consulted while drafting this paper. Additionally, the review and study of reports occurred only from the authentic and official websites.

For a better understanding, I adopted a mixed-methods research design to comprehensively explore about the Smart Cities mission and incorporated both quantitative and qualitative methods to capture different dimensions of the issue. Also utilized a descriptive and analytical approach to understand the objectives, integration and model of the Smart Cities Mission.

I tried to enhance the validity of findings by employing multiple data collection methods, triangulating sources, and validating instruments and ensured the reliability of data through rigorous sampling techniques, standardized data collection procedures, and systematic analysis. I also addressed potential sources of bias and mitigate threats to internal and external validity throughout the research process.

Lastly, as per the NTCC guidelines, I've tried my best to gather information as of my research and put forward the principled record of Smart Cities Mission.

INTRODUCTION

The National Smart Cities Mission was launched in 2015 and The Union Ministry of Urban Development was responsible for overseeing and implementing the mission. There were a total of 100 cities allotted among the states and UTs which was done on the basis of a particular criteria. The mission was launched

by Prime Minister Narendra Modi. The aim of the mission was to advance the urban areas and improvise the quality of life of the people living there. The Smart Cities Mission is also critical because it faces the challenges of technological integration. The process of urbanization in India has led to problems such as pollution, inadequate infrastructure, poor public services. The Smart Cities Mission aims to resolve these issues by urban planning, improving resource management and improving public services. The selected cities receive funding for implementing these solutions and make the cities sustainable. It has been designed to build cities which can provide high quality of life. Making cities more livable, efficient, and responsive to the demands of their citizens is the goal of the Smart Cities Mission. In light of India's remarkable urbanization, which is characterized by a rise in urban migration, this mission is a calculated reaction to develop resilient, sustainable urban environments that can also harness digital innovations to enhance public administration and enhance the welfare of citizens. The Smart Cities Mission works to alter the urban landscape and handle the complex issues brought on by India's rapid urbanization through a combination of public-private sector collaboration.

OBJECTIVES

The first objective of the mission is that the community will be the focal point for all the planning and execution, which means that the community engagement is most important while making any development plans. Another objective is that there should be possibility of generating better outcomes with fewer resources, which means that more benefits should come out of the available resources. Another very important principle is that new innovative methods should be adopted for generating sustainable and integrated solutions, this should be done so that sustainable development can come into effect. Moreover, the technology is a means of achieving the goal and not the ultimate goal. The technology which is relevant for the particular city must be adopted. The cities are selected through a fixed process and sectorial and financial convergence must be kept in mind. Ensuring efficiency and accessibility for all inhabitants by modernizing and upgrading essential services including waste management, sanitation, and water delivery. building public areas, leisure spaces, and infrastructure that meets the many requirements of the populace in order to promote social and cultural inclusion. Encouraging individuals to actively participate in the decision-making process and ensuring that urban planning and development take their needs and feedback into account. promoting investment, innovation, and job creation in urban areas through the application of clever ideas in order to boost economic growth. In order to close the digital divide and guarantee that all population segments benefit from smart city efforts, digital inclusion must be promoted.

CITY SELECTION AND CRITERIA

For cities to be developed as smart cities, a comprehensive evaluation is done based on a specified criteria which makes it easier to identify cities which have the capacity to use innovation and technology for sustainable development. The cities engage in a City Challenge competition which includes two stages. The first stage of City Challenge requires the city to submit a Smart City Proposal (SCP) in which they have to outline their objectives, plans and strategies. The proposals which the cities submit also must include the development plans and what initiatives they are going to take. A fixed criteria for evaluation has been defined by The Ministry of Urban Development which serves as a manual for the cities to provide their proposals.

The second stage involves the selection of the cities where a panel of experts along with different organizations and institution are responsible for doing the task within a fixed period of time. The winners

of the challenge are announced by the Ministry of Urban Development. The cities who became the winners start working on the procedures for making their cities smart and the cities which were not selected star working on improvising their SCPs so that they can be considered in another around.

IMPLEMENTATION STRATEGIES

The cities focus on Area-Based Development (ABD) which means that the cities will focus on developing specific areas with which they can employ creative methods and tackle the local issues. Special Purpose Vehicle (SPV) is created for the purpose implementing the mission at city level. The SPV is responsible for the planning of the mission, approving the mission, managing the funds and operations and the evaluation of Smart Cities development projects. Every Smart City will have a established SPV with a full-time CEO which will have a board including nominees from the Central, State Government and ULB (Urban Local Bodies).

It is the responsibility of the states/ULBs to ensure that the SPV is provided with a dedicated revenue source to enable it to become self-sustaining and that the government's investment in Smart Cities is limited to the development of facilities which benefit the general population.

To improve the overall urban governance and the standard of life, cities make use of pan-city programs which utilize technology such as traffic and waste management.

PPPs (Public-Private Partnerships) are often implemented by cities so that they can finance for the smart city initiatives. Partnering with the private sector organizations helps to bring in expertise and improvise technology.

The process of implementing also involves a very crucial step, which is the citizen engagement. The cities include the people in decision-making process, gather feedback and then work to align the initiatives with the community needs. Moreover, the Smart Cities have to prioritise sustainability by using eco-friendly transport solutions and renewable energy sources.

TECHNOLOGICAL INTEGRATION

Internet of Things (IoT) is a key component in smart infrastructure which helps to collect data and share it to multiple devices and sensors. This helps to allow real-time monitoring and analysis. Throughout the cities, many sensors are set up to gather information on variables like air quality, traffic and energy usage. The traffic is monitored in real-time with the installation of IoT sensors and cameras which helps to improvise the traffic management in the cities. The sensors which are installed in bins gives an alert when the bin is full. With the use of these sensors, the efficiency of waste management operations is enhanced. These sensors also help to measure the quality of the air and the noise levels among the other environmental parameters which is used to monitor the pollution levels and identify the sources. This can help to improve the quality of air and water. IoT also helps in managing the water supply and the distribution of water.

The use of smart infrastructure also involves smart grids, which helps in digital communication and improvise the traditional power grid. This helps to optimise the distribution of the energy and manage the consumption while reducing wastage.

The new housing development programs also include the use of technologies such as smart meters and usage of renewable energy sources.

Technology has also come to use in the healthcare sector, such as the use of health monitoring devices and maintaining digital health records which has helped to enhance the healthcare services in smart cities and has contributed to the overall health of the public.

Technology also comes in use for public safety in smart cities through installation of surveillance cameras, facial recognition systems, etc.

Smart Cities applications are also enhanced through the use of blockchain technology which helps in transparent transactions in the financial and administrative processes. Robust technologies like cloud computing, artificial intelligence (AI), and big data analytics provide effective data management and well-informed decision-making on this networked web of instruments. These technologies go beyond immediate benefits to support a sustainable urban development concept in which citizens' quality of life is greatly improved and resources are maximized. The Smart Cities Mission's cooperation of technology and urban design creates a future that is not only more advanced in terms of technology but also more resilient and livable as cities develop into intelligent ecosystems.

URBAN INFRASTRUCTURE DEVELOPMENT

Efforts have been made to enhance the quality of life and increase sustainability. These include improvements in transportation system like metro rail projects, smart parking solutions and the connectivity initiatives such as highways. All these efforts help to reduce traffic and promote sustainable mobility. In many Smart Cities, smart water meters have been installed which help to detect leaks, monitor the quality of water and reduce wastage. Many new public toilets have been constructed to improve sanitation and smart sanitation infrastructure has been adopted for improving public hygiene. In many Smart Cities, public places now have amenities such as free Wi-Fi and smart lighting system which contributes to the well-being of the citizens. Another main focus has been making the household affordable which helps the diverse urban population and also the essential amenities should be provided. Smart waste have also been installed in the smart cities so that waste management can be optimized, wastage can be reduced and there can be cleaner urban environments. With the addition of green infrastructure, sophisticated street lighting, and Wi-Fi access, public places have been reinvigorated. The dedication to sustainable energy practices is further demonstrated by the creation of smart grids and the incorporation of renewable energy sources. The infrastructure initiatives of the Smart Cities Mission take a comprehensive approach, catering to a range of needs and promoting urban resilience, environmental sustainability, and an improved standard of living for citizens.

GOVERNANCE AND CITIZEN ENGAGEMENT

Governance and citizen engagement is crucial for the implementation of Smart Cities Mission. The government of the state ensures that the funds allocated to the SPVs are only used for developmental purposes of the general public. The Central Government is responsible for allocating the funds to different SPVs.

With the help of citizen engagement, it is ensured that urban development matches with the needs of the society. The formulation of policies which guide the citizens is defined by the government. When the policies defined by the government are well-structured, the people are also aligned with the long term development goals. The government is also responsible for overseeing and managing the smart city projects which ensures that people get timely public services and the execution of the project is optimized. With the help of citizen engagement, citizens provide valuable insights which improves the decision

making of the government. Inclusion is promoted via citizen participation approaches, which make sure that the various demands of various demographic groups are taken into account during project development and implementation. As a result of active engagement, citizens are more likely to embrace and support smart city programs since they feel more accountable and own something.

FUNDING MODELS

As a Centrally Sponsored Scheme (CSS), the Smart City Mission will function and the Central Government will be providing financial help to the Mission. The project cost of every Smart City concept varies based on the model, execution and repayment capabilities, and ambition level. Lenders and investors' comfort levels and the strength of SPV's revenue model will determine the project's viability. Money comes from the federal and state governments to back up the Smart Cities Mission. This funding helps cities kickstart new projects and turn clever ideas into reality. Municipalities also use their budgets to support these smart city initiatives, allocating funds for ongoing maintenance and specific projects. To sustain these efforts, cities explore avenues to generate income by charging users and fees for the services provided by smart city initiatives. For example, income from user fees could help fund intelligent parking systems. Through the use of tax increment financing (TIF), development projects can be funded in part with the extra tax income they produce. The value produced by smart city initiatives is captured with its assistance. For the purpose of funding smart city projects, cities can issue bonds. Future revenue streams from the projects are frequently used to repay these bonds. looking at cutting-edge funding options like impact bonds, green bonds, and other financial vehicles intended to draw in private funding for worthwhile and sustainable projects. The Smart Cities Mission cannot be successfully implemented without the support of public-private partnerships. PPPs combine the best aspects of both industries, utilizing the resources and knowledge of the private sector to support public sector programs. Particular smart city projects are frequently developed and implemented with the assistance of private partners. This covers the creation of infrastructure, the use of technology, and the provision of services. Capital for smart city initiatives comes from private investors. They might offer loans, make investments in the construction of infrastructure, or take part in revenue-sharing schemes.

Projects involving smart cities are funded in part by private investors, both domestic and foreign. Sovereign wealth funds, institutional investors, and private equity might all fall under this category. Private companies may collaborate with or invest in cities for smart city projects, particularly those with expertise in technology, infrastructure, and urban development. Financial firms may provide loans to cities in order to fund smart city initiatives. Grants and subsidies for cities can come from a variety of places, such as foreign development agencies, government entities, and non-profits.

CHALLENGES

A major barrier is the lack of funding that many cities have, which prevents them from making large investments in smart city initiatives. Municipalities frequently struggle with a lack of the technical know-how and resources required for sophisticated initiative development, execution, and management. Due to slow implementation, complicated legal requirements, and bureaucratic procedures, project delays are prevalent and negatively affect the mission's overall efficacy. The smooth integration of smart city efforts is hindered in many locations by the fragmented urban planning that already exists. Furthermore, low public awareness and participation make these projects less successful, highlighting the necessity of active participation. The significant gathering and use of data raises privacy and data security issues, emphasizing

how crucial it is to protect sensitive data. The integration of technologies and solutions from different manufacturers presents problems related to standardization and interoperability. Other challenges include managing policy and regulatory barriers, resolving digital inclusion issues, and sustaining and maintaining smart infrastructure.

A number of factors, including low digital literacy and restricted access to technology, could prevent some groups from fully engaging in and reaping the benefits of the smart city ecosystem.

IMPACT

A number of key changes have been made as a result of the adoption of smart city initiatives, improving inhabitants' general quality of life. Important measures for assessing the mission's success include key performance indicators and results. Urban services have been streamlined by the implementation of cutting-edge technologies in transportation, waste management, water supply, and sanitation. This has improved access to clean water, decreased traffic, and increased the efficiency of waste management. Energy-efficient street lighting and sophisticated traffic management systems are two examples of smart infrastructure that has improved urban mobility while also promoting environmental sustainability. The Smart Cities Mission has brought in a new era of data-driven decision-making in the field of government. Real-time information is now available to city leaders, allowing them to respond proactively to urban concerns. An example of the move towards citizen-centric government is the increased public trust and engagement brought about by the transparent and responsible use of technology. The mission has also promoted public involvement through community engagement initiatives, guaranteeing that locals have a say in how their towns develop. The restoration of public areas and the encouragement of artistic and recreational endeavors are two examples of how the Smart Cities Mission has impacted culture. In addition to enhancing the physical infrastructure, smart city efforts have enhanced the general well-being and cultural vibrancy of urban regions. The creation of smart infrastructure has attracted companies and promoted innovation hubs, stimulating economic growth. Together with these economic developments, job creation has increased, giving local populations access to new employment prospects and fostering a vibrant urban labor force.

In order to ensure that the advantages of clever solutions reach a variety of demographic sectors, the mission's emphasis on digital inclusion has been crucial in bridging the technology gap. The way cities are built, run, and experienced has changed dramatically as a result of the Smart Cities Mission. It has promoted a culture of creativity and flexibility, enabling communities to change quickly in response to new requirements and technological advancements. As the mission progresses, it will probably have an impact on social dynamics, economic environments, and environmental sustainability, among other aspects of urban life. In addition to being a technological advancement, the Smart Cities Mission is a comprehensive movement that seeks to build cities that are not only more intelligent but also more resilient, inclusive, and sustainable.

CONCLUSION

To conclude, the Smart Cities Mission in India has proven to be a revolutionary endeavour that has significantly enhanced urban infrastructure, governance, and overall quality of life. The efficiency of transportation, waste management, water supply, and other vital sectors has been greatly increased by the integration of cutting-edge technologies, especially through IoT applications. The influence goes beyond observable enhancements; it affects employment development, economic expansion, and the cultural

vibrancy of metropolitan areas. The trip has not, however, been without difficulties. The smooth implementation of smart city programs is hampered by bureaucratic procedures, financial limitations, and the requirement for constant change. Through perseverance and flexibility, the mission has been able to overcome these obstacles. In addition to streamlining urban services, the incorporation of Internet of Things (IoT) applications has improved data-driven decision-making and opened the door for citizen-centric governance. The influence on job creation and economic growth highlights how smart city efforts can operate as triggers for more extensive socio-economic development.

Despite its achievements, there are still issues, such as a lack of funding and the requirement for flawless cooperation between numerous parties. The mission's continuous progress shows a dedication to tackling these issues and modifying tactics to fit the changing urban environment. The necessity of an inclusive and comprehensive approach to urban development is highlighted by the cooperative efforts of communities, the private sector, and the government. For other countries attempting to navigate the challenges of rapidly increasing urbanization, the Smart Cities Mission acts as a model. It emphasizes how crucial it will be to shape future cities by embracing technology, encouraging citizen interaction, and placing a high priority on sustainability.

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