

Transforming 'traditional' cities into 'smart' cities

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Abstract. This paper aims to discuss the challenges of transforming 'Traditional' cities to 'Smart Cities' and the tools that can be used to transform 'Traditional' cities to 'Smart' cities in the Indian Context. In this context, this paper discusses the expectations and goals of the Smart City India Mission for the 100 Smart cities, the existing scenario of the 'Traditional' cities, the current status of the Smart cities in India and concludes that 'Traditional' cities can become 'Smart' by developing a base line scenario and developing a 'Road Map' to become 'Smart'. The 'Road Map' must consist of the following four stages: Assessment, Vision, Project Plan and Metrics.

1 Introduction [1]

A 'Smart' City is defined as a developed urban area that creates sustainable economic development and high quality of life by excelling or becoming "smart" in multiple key areas; economy, mobility, environment, people, living, and government. Recent interest in smart cities is motivated by major challenges, including climate change, economic restructuring, and the move to online retail and entertainment, ageing populations, and pressures on public finances. Basically, a "Smart City" uses information technology to make more efficient use of physical infrastructure, support a strong and healthy economic, social and cultural development and engage effectively with citizens in governance and decision making

1.1 Smart Cities in the Indian Context [2]

32% of the total population in India is urban and it contributes to over sixty percent of India's GDP. It is projected that urban India will contribute nearly 75% of the national GDP in the next 15 years.

India is at a point of transition where the pace of urbanization will speed up. The relatively low base presents an opportunity to plan the urbanization strategy in the right direction by taking advantage of the latest developments in technology especially in ICT (Information and Communication Technology). It is in this context that the Government of India has launched the Smart City Mission in 2014 and has decided on developing a hundred (100) "Smart Cities" in the country.

The Ministry of Urban Development, in its concept note, has visualized that a smart city "will have to provide a very high quality of life,

i.e., good quality but affordable housing, cost efficient physical, social and institutional infrastructure (water, sanitation, 24/7 electricity), clean air, quality education, cost effective health care, security, entertainment, high speed connectivity and efficient mobility; it must also attract investments, experts and professionals.

The 100 smart cities are to be developed in population ranges of up to one million, one to four million and over four million.

The 100 smart cities mission intends to promote adoption of smart solutions for efficient use of available assets, resources and infrastructure with the objective of enhancing the quality of urban life and providing a clean and sustainable environment,

Special emphasis will be given to participation of citizens in prioritizing and planning urban interventions.

The India Smart City Mission has developed several guidelines and components for developing Smart cities.

The major components are:

1. Area based Approach – including retrofitting, redevelopment, pan-city and greenfield development initiatives
2. Citizen engagement for visioning - to involve all sections of society who are affected by a decision in the decision-making process and come up with proposals that are citizen-driven.
3. Financing proposals with revenue models - to attract Public Private Partnerships (PPPs) for infrastructure development and other projects by setting up Special

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Purpose Vehicles (SPVs) that would be responsible for the PPPs.

2 Current Urban Challenges in India[2]

India is facing many of the global urban challenges of large urban populations and overcrowding in the cities.

Some of these challenges are:

- Managing size and rapid growth
- Providing Urban Services
- Reducing Poverty
- Housing for all
- Making Cities Healthy
- Making Cities Environmentally Friendly
- Solving Traffic and Transportation Problems
- Supporting Social Development

2.1 'Traditional' Cities – Current Scenario

Economy - No strategy for attracting investment, no specific industrial or economic zones and no identity developed for the city.

The long-term dependence on Central and Local funds have made the cities complacent and they have not yet developed a working culture of developing strategies and policies at the local level for attracting investments. Therefore, they have not yet felt the need to develop a strong identity for the city that will help attract investments.

Environment - No vision for energy efficient buildings and systems, concept of green buildings not introduced, no policies for renewable energy, no strong policies for sustainability, environmental preservation and resource management.

Several of the Smart Cities Mission strategies require the cities to strongly embrace environmental stewardship, resource conservation and environmental preservation. Until now, the cities have not been proactive in these areas. In order to be proactive in these areas, strong implementation environmental policies must be in place and the staff must be capable of implementing and enforcing these policies.

Government - Departments are scattered with no data sharing /collaborations, limited and scattered online access to citizens, citizens cannot make optimum use of city services

At present, the Government Departments are scattered and work in isolation. There is no data sharing and collaboration between the departments. This is because a lot of the data is still in paper form and have not been transferred to digital data. With digital data, data sharing and collaborations are relatively easy and services provided by the various departments are more effective. A work culture of a multi-disciplinary approach to finding solutions is not yet implemented.

Governance/Public Participation – Online services for services has not been adopted to its fullest capacity and citizens have never participated or have been involved in decision making for citizen centric solutions.

E-services and citizen participation in decision making from conceptual stage is not yet implemented.

Living - Inadequate social infrastructure, parks and open spaces, health facilities and services are scattered, crime prevention is inadequate.

City services have not kept pace with the rapid population growth in the cities and therefore, social infrastructure and health services are inadequate for the population they serve.

Mobility - Existing transportation systems are inefficient and not cost effective

Transportation services have not kept pace with the rapid population growth in the cities and therefore they are inadequate for the population they serve.

People - Education systems not available for all levels of education, affordable housing and services for the poor are inadequate.

City services have not kept pace with the rapid population growth in the cities and therefore, social infrastructure and health services are inadequate for the population they serve.

The Smart City India Mission strategies and components have been developed to address and overcome the above drawbacks and help cities upgrade themselves.

2.2 Current Status of Smart Cities in India [3]

The 100 selected Smart Cities, with the help of consultants, have developed several proposals based on the Smart City requirements. However, the development of Smart Cities in India has been slow, and the funding has not been fully utilized according to the time-lines for utilizing the funds. Given the current scenario of the "Traditional" Indian cities, the cities are not fully capable of implementing the Smart cities proposals and components.

This current scenario is creating several roadblocks to achieving the goal of 100 Smart Cities by 2020.

Some of the road blocks are:

- Inaction
- A lack of understanding
- A dearth of technical training & skills
- Non existent security framework for data.

The reason for this inaction is that the Local and State Government system has been used to a relationship of getting grants from the Central Government that did not

require strict accountability measures with respect to the “quality” of delivery.

Now, accounting systems must be improved and quality control measures must be included for accountability.

Now, suddenly, the Local governments must come up with sustainable solutions and be accountable for them. This requires a change in mindset. Even if the mindset is changed, capacity building is the biggest hurdle. Training a large work force to upgrade their skills to be able to understand and implement the new components is a major task that cannot be accomplished in a short period of time.

In addition, the legacy of the old technologies complicates the ability to make valuable solutions. Sudden upgradation of old technologies is complicated and hinders progress.

Finance is another obstacle with the focus on the PPP model to fund smart cities. Most of the city staff are not trained to implement PPP financial models.

Many cities are also facing resistance in the execution of projects. Citizens have opposed user charges for services provided under the mission.

The citizens have not been made fully aware of the benefits of the projects with effective citizen participation resulting in opposition during various stages of the projects.

The Smart Cities Mission strategies and components can only be fully utilized to bring the much-needed value addition if the cities develop a “base line” scenario.

The “base line” scenario is a scenario where the “Traditional” cities have upgraded themselves and improved in all of the above components to be “ready” to develop, implement and enforce the Smart City components and strategies.

The base line scenario must be used to develop well-planned approaches to effectively utilize the Smart City strategies and components.

Therefore, the ‘Traditional’ Cities must develop a Road Map to develop a Base Line scenario and transform themselves into ‘Smart’ Cities.

3 Road Map [4]

For a ‘Traditional’ city to develop a Base Line scenario and transform itself into a ‘Smart’ city, innovations and progress must be made for the following:

1. Organization – An established and efficient organization structure to lead to a smarter city. This could include organizational changes and/or restructuring to address and utilize the new strategies and components.

This would require a major organization changes with the addition of new departments or the reorganization of old departments to handle the new requirements.

2. Technology – Improvements to evolve the right way. This could include making investments in appropriate technologies and training staff to fully utilize the capabilities of the technologies

This would require major investments in appropriate and new technologies and elimination and phasing out of out-dated technologies to implement the new requirements and provide services efficiently.

3. Social aspect – To make the population evolve the right way. This could include educating the citizens regarding capabilities of online services, educating the citizens about sustainability, waste segregation, conservation of resources and the benefits of citizen participation in Governance.

A major program to fully involve citizens in Governance must be developed and implemented either entirely by the Government or with the help of NGOs.

4. Capacity Building – To develop sustainable solutions and be accountable for them. This could include highly specialized training for staff for all aspects of Governance to make them understand and implement Global best practices locally.

This would require specialized training for all levels of staff to help them understand and implement the new components. This training will also require a major investment.

The Road Map must consist of the following four stages:

1. Assessment

A ‘Traditional’ city can assess the current scenario with respect to the key areas of a ‘Smart’ City including Financing. This assessment will help the City assess their needs for improving their capabilities to effectively utilize the Smart City strategies.

This would require creating an up to date inventory of existing infrastructure, services, population, housing, services, green areas, resources etc. to understand what is lacking, what is working and what is redundant. This will essentially be a “snap shot” of the current scenario and existing conditions in the City.

2. Vision

Although the selected Smart Cities have developed proposals according to the requirements of the Smart City Mission, the implementation of the proposals has been very slow. Developing a ‘base line’ scenario and timeline for accomplishing what can be achieved in next year, 5 years, 10 years will help.

The Smart Cities guidelines also prescribe various deadlines for implementing the proposals. Release of funds is after each phase of the proposals is implemented. The cities have not been able to fully implement the proposals to seek a release in funding.

Therefore, developing a “Base Line” scenario and developing phases of implementation and accomplishment will help. The implementation targets must be set for the immediate next year, 5 years and 10 years. At each phase, the targets must be reviewed to see what has been achieved, what has not been achieved, why certain things have not been achieved, what corrective measures must be taken to achieve these targets etc.

3. Project Plan

A project plan must be developed on how the above vision will be achieved within the targeted timelines. Milestones must be developed for the next one year (immediate), next five or ten years (short term) and next 20 years (long term).

For the immediate milestones, improvement of existing mechanisms, data collection and assessment of requirements and other targets and goals that are easily accessible (low hanging fruit) must be accomplished.

For the short-term milestones, certain major frameworks, policies and implementation must be completed.

For the long-term milestones, all the tasks must be completed and implemented.

In addition to the above, a detailed funding plan listing how the funding will be obtained for each milestone must be developed.

4. Metrics

Performance Metrics must be utilized for each milestone phase to determine if the tasks were completed within the projected timelines, within the budgeted amounts and whether the targets fulfill the smart city vision and goals. The metrics should also assess tasks that could not be completed, the reason they were not completed and how these affect the overall vision and goals.

By effectively incorporating the Smart City strategies and components, the ‘Traditional’ cities can become ‘Smart’ and meet the performance targets for Economy, Environment, Government, Governance/Public Participation, Living, Mobility and People.

By becoming ‘Smart’, Indian cities the Indian cities can effectively accomplish the following:

- Tackle Climate Change
- Use Local Resources
- Construct Green and Eco-friendly Buildings
- Grow the Cities Green Footprint

- Make Dynamic Downtowns
- Enhance Social Infrastructure
- Provide Housing for various income groups
- Provide multimodal connectivity
- Plan for Disasters
- Promote Economic Development

4 Conclusion

Although the selected Smart cities in India have developed proposals for becoming ‘Smart’ according to the Smart City India Mission strategies and components, implementation of the proposals has been very slow.

Given the current scenario of the “Traditional” Indian cities, the cities are not fully capable of implementing the Smart cities proposals and components.

This current scenario is creating several roadblocks to achieving the goal of 100 Smart Cities by 2020.

Some of the roadblocks are:

- inaction
- a lack of understanding
- a dearth of technical training & skills
- non-existent security framework for data.

The Smart Cities strategies and components can only be fully utilized to bring the much-needed value addition if the cities develop a “base line” scenario and develop well-planned approaches to effectively utilize the Smart City strategies and components.

The base line scenario must be used to develop well-planned approaches to effectively utilize the Smart City strategies and components.

Therefore, the ‘Traditional’ Cities must develop a Road Map to develop a Base Line scenario and transform themselves into ‘Smart’ Cities.

For a ‘Traditional’ city to develop a Base Line scenario and transform itself into a ‘Smart’ city, innovations and progress must be made for the following:

Organization, Technology, Social Aspect and Capacity Building

The Road Map must consist of the following four stages:

Assessment, Vision, Project Plan and Metrics.

By effectively incorporating the Smart City strategies and components, the ‘Traditional’ cities can become ‘Smart’ and meet the performance targets for Economy, Environment, Government, Governance/Public Participation, Living, Mobility and People.

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