

A Study of Key Attributes Accountable for Development of a Smart City Projects & Factors Impacting its Implementation in India

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Abstract:

The concept of Smart Cities was first thought of by IBM in 2008 when world was facing its worst economic crisis. Then it was taken up by various countries around the world. The main objective here is to build and promote the cities which will provide the core infrastructure and provide the decent quality of life along with a clean and long-lasting environment which will be supported by smart technologies & solutions. Though smart city concepts are very new to India, where technology is mostly used in urban cities. So, in such a scenario one may ask a very basic question that “How a city can be made Smart?”. So, if we look around and see what are the things that some smart cities around the world are doing differently, then we may notice that they have addressed basic issues faced by any metropolitan city in a smarter way possible. For instance, we can see that the already developed smart city projects have addressed transportation, energy, crime, water management & other issues using current technologies & applications. If we leave aside the technology gap between rural & urban India, it is certain that Urban areas are already in need of Smart City Projects because of Population. But again, this needs a strong political will power to take quick decisions and aligned with technological advances such as E governance, online tendering of the government work which will be transparent and efficient. but often it is misunderstood that use of IT in administration and governance is the only meaning of Smart City Projects, but in fact if you are able to achieve all the issues such as administration, governance, transportation, water management, energy supplies, waste management, water treatments plants, meaningful use of public private partnerships in managing transportations and road constructions and evening installations of solar panels and LED bulbs across city. So basically, there are many factors contributing to create a smart city. The main factor which will drive this kind of ambitious projects are political will powers of government, without a political will power it is very difficult to complete the bigger projects. As there is lot on stake for such a large-scale project which will easily span over next decade.

Keywords: Smart city, Smart technology, Information and communication technology (ICT), PESTLE, Population

I. INTRODUCTION

Urbanization is taking place in India at a very fast rate. We have to build new cities to accommodate population of India. We have a great opportunity to convert such new cities into smart cities.

Government of India has come out with an innovative concept on smart cities. We have to go through detail and worked out a model of smart city. That is, in addition a sustainable Industrial city with Zero pollution.

While planning of smart city should consider a horizon of at least four decades. The smart cities should be build module by module and each module being more or less self-sufficient with the future improvements and lifestyle change.

II. DEFINITION OF A SMART CITY

India's Prime Minister Mr. Narendra Modi has proclaimed a vision of creating 100 smart cities in India. Below are some of the characteristics a smart city should have –

1. E-city –
Smart city should have broadband connectivity. All major spaces should have wi-fi. The city should be covered with CCTV cameras. All School and colleges should be well equipped with electronics and internet for e-learning. All Government services should work in smart way.
2. Zero Pollution and Sustainability –
Smart city should be compact. Walking and bicycling should be major modes of travel. Public transfer should be electric Solar Panels on rooftop should generate electricity. All rainwater should be harvested. Well planned with result in Zero air, water and sound pollution.

3. Industrial city with Export orientation –
Export oriented manufacturing industry should be encouraged in the smart city. An employment opportunity is also one of the most important in smart city.
4. Future Ready –
Children of smart city should receive education with focus on innovation and research.
5. High living standard at an Affordable Cost –
Smart cities should have availability of all modern amenities like shopping malls, multiplex, hotels, hospitals, restaurants, beauty parlours etc. cost could be kept under control by innovation and reasonably priced land and electricity.

Few cities around the world have actually grown into truly ‘Smart’ cities, and most of them are still in the early phases. Information and communication technology (ICT) allows city to directly interact with community and to monitor what is happening in the city and to enable a better quality of life.

ICT is used to increase quality performance and interactivity of services to improve contact between citizen and government. Before one decides to build the smart city, we must know what are the benefits and need of the society. For this we should know the people, their age’s groups, their needs, hobbies and sources of income for the city. There are many smart technologies which can be implemented in order to build a smarter city in an efficient way. Let us see what all technologies can be used in our mission to create a smart city.

III. SMART TECHNOLOGIES USED AROUND THE WORLD

- 1) IT enabled administration
This will encourage people to actively use and be a part of administration. This will also help administrators to manage efficiently.
- 2) Water ATMs
Water ATMs will make it easier for citizens to get access to clean drinking water and in turn administrators to control and provide the facilities at much cheaper costs. This will also include the Sewage Treatments plants and water desalination plants in coastal areas.
- 3) LED Lights/Solar Lights
Already many city administrations are using the LED lights in place of Conventional Street lights, which actually saves electricity costs and are very efficient.
- 4) Digital Parking Allocation
Need to develop digital system which will enable people to book the parking lots thru their mobiles.
- 5) Fully automated waste management system
Waste management needs to be fully automated right from collection, transportation, segregation, and disposal of waste. Development of Green Societies with recycling of waste water for gardens.
- 6) Smart Toilets
Smart toilets are needed to make the litter free society, this is very important in India.
- 7) Digital Libraries
This will encourage e-learning/skill development in youths for better job prospects.

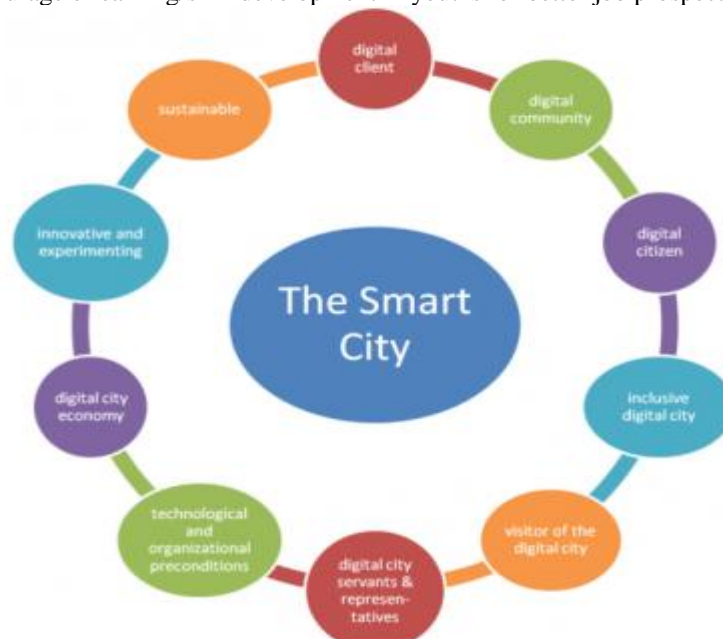


Figure 1: Technologies used in the smart city around the world

IV. KEY ATTRIBUTES ACCOUNTABLE FOR CREATING SMART CITY

Let us see what all key attributes are collectively accountable for creating the smart cities and factors impacting its implementation in India.

- 1) Administration and Governance –
This is most talked about factor in creating Smart cities, with technology growing in leaps and bounds people wants all the information on their fingertips. So are the expectations from city administration and that's why we can call administration and governance as Face of Smart Cities. So, in order to make this administrations and governance smarter information technology in playing a greater role in this. We can take certain examples like property tax, electricity bills, water bills payments and property related sanctions are all available on finger tips for users with all types of integrations available on different devices. Ultimately reducing the turnaround time for users and also for administrations. As with information Technology in place one can use the minimum resources very efficiently.
- 2) Better Utilities –
Such as Energy, water, waste management. This is very important aspect of human life whether it is for smart cities or for normal day to day life in rural areas as well. We cannot neglect this area. In order to bring reforms in this sector, smart cities need to work on the blue print of water, waste management before developing the cities transportations and other services.
- 3) Meaningful partnerships with Private firms –
The meaningful partnerships with private firms are a key in creating a smart city. We can take the example of MSRDC partnering with private firms in order to develop the state highways and then recover the capital as a toll from highway users. With these public private partnerships on can be assure of much needed capital along with efficient delivery of services with industry level standards. And there is no boundary for these partnerships it can range from road constructions to streetlights to basic passport services where there is provision to charge against a service directly or indirectly.
- 4) Safety & Security of Citizens –
This is very important to have all the technologies in place for the safety of citizens such as video cameras and proper lighting in all areas and even some emergency response teams to respond quickly in case of any such emergency.
- 5) Financial ability to sustain –
This is most important aspect, because capital needed to run all the business needed to be identified and captured as revenue generations opportunities. Such as property taxes, utility bills and marketing related benefits.
- 6) Collaborative municipal bodies with support from local residents –
For this to happen the current elections systems needs to be revamped and made more inclusive of common citizens considering their inputs and participation.
- 7) Appropriate Social infrastructure –
Smart cities should have enough education, medical, recreational, retail, sport related infrastructure. So that day to day living is also more enjoyable.
- 8) Better public transportation –
This will eventually encourage people to use public transport for day to day travel by reducing the carbon footprint and also achieving the traffic free roads and lesser commutation times. Currently there is lot of dependency on petroleum fuels and in near future this will be replaced with solar/electricity powered vehicles.
- 9) Population controlled areas –
this is very hypothetically correct scenario where we can decide on the number of people who can live in Smart City projects.

It is very difficult to achieve all above-mentioned attributes in case of Indian context. So even if we can achieve at least 75% of them we can actually call that urban area or city a Smart City.

V. FACTORS IMPACTING THE IMPLEMENTATION OF SMART CITY PROJECT

Let us do a PESTEL analysis to analyse and monitor the macro-environmental (external marketing environment) factors are impact the implementation of Smart City project in India. The result of a PESTEL analysis is used to identify threats and weaknesses.

PESTEL stands for:

- P – Political
- E – Economic
- S – Social
- T – Technological

- E – Environmental
- L – Legal



Figure 2: Factors Impacting the Implementation of Smart City project

Let us look at each of these macro-environmental factors in turn.

- Political Factors –**
These all depends on political willpower to take bold and reformative decisions to boost the economy. This will include all those decisions about new policy making, political stability, fluctuations in overseas markets, foreign trade & tax policy, different laws and every other policy and decisions which will affect the economy of nation. And all these decisions always have an impact on any new initiative or project. These kinds of new projects will always have to adjust & respond to the current/future legislation and amendments in laws & policies.
- Economic Factors –**
Economic factors always have a major impact on the success and progress of a project. These Economic factors include the budget of project, tenders, expenditure, sources of income for the city administrations to support such a large-scale project. Even the lending rates of bank, who are supporting these projects.
- Social Factors –**
We can also categorize this into social & cultural factors, which involves the belief and attitude of the community. Such as – population growth in the community, age wise distribution, awareness of healthy habits in community, career aspirations and attitude towards life of the young generations and many more. These factors will drive the solutions and applications needed in a smart city.
- Technological Factors –**
As we can see that, the rate at which the technological landscapes are changing around the globe and it impacts the way we do our day to day work.
- Environmental Factors –**
The world has acknowledged the environmental changes and its impacts on the human life. Suddenly human race has started giving importance due to inadequate supply of raw materials, increasing pollution, carbon footprints. These are just some of the issues any big project like “Smart City” could face.
- Legal Factors –**
There are many legal factors like health and safety norms, land acquisitions, smart technology licenses and many more.

These are some of the factors which will have direct or indirect impact on the implementation of Smart City project in India.

VI. CONCLUSION

The Smart City project in in very early stage in India currently. So, it will be very unfair to criticize the project. But considering its pros and cons, one must say that government has taken a very bold step to turn the bigger cities into Smart Cities. We already have some success stories where other nations from Europe, Asia and North America were able to create the smarter cities, so if we can implement the models/approaches used by

those countries then it would be assuring and easy for India to create its first Smart city, which can be followed by other city administrations to develop their own cities into Smart Cities. As a developing country India has a very good future and investing in Smart City Projects will really benefits the government and its Citizens. As citizens will benefit with good infrastructure and facilities and it will be very easy for city administrations to run the smart cities efficiently for upcoming decades.

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