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Overview of Smart Cities with Indian Prospect

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Introduction:

Cities are facing unprecedented challenges. The pace of urbanization is increasing exponentially. Every day, urban areas grow by almost 150 000 people, either due to migration or births. Between 2011 and 2050, the world's urban population is projected to rise by 72 % (i.e. from 3.6 billion to 6.3 billion) and the population share in urban areas from 52 % in 2011 to 67 % in 2050. In addition, due to climate change and other environmental pressures, cities are increasingly required to become "smart" and take substantial measures to meet stringent targets imposed by commitments and legal obligations.

Furthermore, the increased mobility of our societies has created intense competition between cities to attract skilled residents, companies and organizations. To promote a thriving culture, cities must achieve economic, social, and environmental sustainability. This will only be made possible by improving a city's efficiency, and this requires the integration of infrastructure and services. While the availability of smart solutions for cities has risen rapidly, the transformations will require radical changes in the way cities are run today.

Thus developing smart cities is not only just a process whereby technology providers offer technical solutions and city authorities procure them. Building up smart cities also requires the development of the right environment for smart solutions to be effectively adopted and used. The development of a smart city requires participation, input, ideas and expertise from a wide range of stakeholders. Public governance is naturally critical, but participation from the private sector and citizens of the community are equally important. It also requires a proper balance of interests to achieve the objectives of both the city and the community at large.

The three pillars of development

There is no single trend, solution or specific approach for smart cities. Regional trends illustrate that there are divergent urban growth patterns among major regions with different levels of economic development. Still, significant disparities in the level of urbanization can also be observed across different countries within the same region. Nevertheless, all cities aiming to develop into smart cities have to be built on three sustainability pillars:

1. ***Economic sustainability***

   Cities need to provide citizens with the capacity to develop their economic potential, and attract business and capital. With the global financial crisis, the economic sustainability of cities has taken centre stage. The crisis has unearthed considerable weaknesses in the financial models and planning strategies of public authorities in the provision of services and in their infrastructure investments. Their financial sustainability now depends also on new financial models, as well as more efficient and better-integrated services and infrastructures.

2. ***Social sustainability***
   A city's attractiveness for people, business and capital is closely related to the quality of life (QoL), business opportunities and security and stability, which are guaranteed by social inclusiveness.
3. ***Environmental sustainability***
   Cities face a number of environmental sustainability challenges, generated by the city itself or caused by weather or geological events. To reduce the impact of the city on the environment resource it is important to promote the effi cient and intelligent deployment of technology and to integrate infrastructures. This process can also be developed in such a manner as to increase the resilience of the city to environmental shocks.

These three pillars have one common denominator, namely the need to achieve more and better with less, i.e. efficiency. Efficiency must also be achieved in a manner that brings benefit and opportunities to citizens, making the city more dynamic and participatory

Smart technology solutions create value.
Rather than being an expense, smart technology integration can create considerable opportunities for added value in any city. Technology integration helps cities to improve efficiency, enhance their economic potential, reduce costs, open the door to new business and services, and improve the living conditions of its citizens. A key condition for value creation through integration is the compatibility of technologies; which is best achieved through common and consensus-based standards that ensure interoperability.

Presently, however, smart city projects concentrate mainly on vertical integration within existing independent infrastructure and services silos, e.g. energy, transport, water or health. A truly "smart" city requires horizontal integration as well as creating a system of systems capable of achieving considerable increases in efficiency and generating new opportunities for the city and its citizens.

Stakeholders are key drivers to smart city solutions.
A smart city cannot be imposed by decree, as the city is shaped by a large number of individual decisions and social and technological changes cannot be fully accounted for. With the present advances in telecommunications, information and communication technologies (ICT) and affordable energy efficiency and energy production tools are changing the relationship between citizens and city services.

Citizens are increasingly becoming providers of city services and not only users. A good plan requires the participation, input and ideas from a wide range of stakeholders within the city. This means that city planning needs to allow for bottom-up processes of modernization. The stakeholders are:
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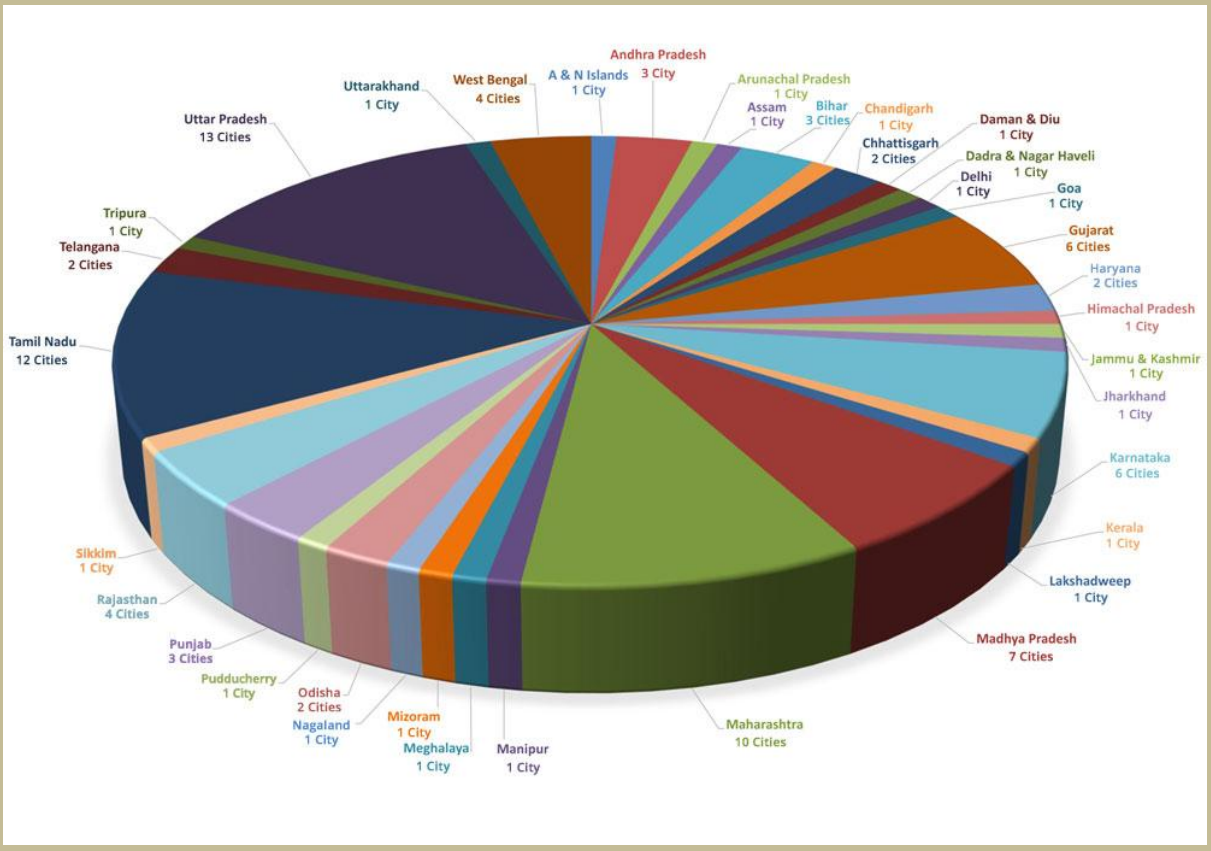
- Political leaders, managers and operators of the local government (city).
- The service operators – public or private: water, electricity, gas, communication, transport, waste, education, etc.
- End users and prosumers: inhabitants and local business representatives.
- Investors: private banks, venture capitalists, pension funds, international banks.
- Solution providers: technology providers, financiers and investors.

Giving to each of these groups a true stake in smart city development is important to achieve the necessary consensus for the changes. Their concerns need to be carefully considered and acknowledged, and ultimately the direction and next steps have to be collectively approved. In the absence of proper consultation, the authorities will sooner or later face considerable additional obstacles to make their vision a reality.

India to have 100 Smart Cities across 21 States in next 5 years.

A total of Rs 98,000 crore has been approved by the Cabinet for development of 100 smart cities and rejuvenation of 500 others. For Smart Cities Mission, Rs 48,000 crore and for Atal Mission for Rejuvenation and Urban Transformation (AMRUT), a total funding of Rs 50,000 crore has been approved by the Cabinet.



Future roadmap for Smart Cities in India

- 100 smart cities: The government has allocated an outlay of Rs 98,000 crore (US$ 15,329.26 million) to execute 100 smart cities, and the Atal Mission for Rejuvenation and

Urban Transformation (AMRUT), which is an urban rejuvenation programme for 500 towns and cities in next 5 years.

- Smart heritage cities: The government has introduced a project to develop 12 heritage cities across the country. Called HRIDAY Scheme or National Heritage Development and Augmentation Yojana, the cities included are Ajmer, Amaravati, Amritsar, Badami, Dwaraka, Gaya, Kanchipuram, Mathura, Puri, Varanasi, Velankanni and Warangal.
- Smart ports: The government plans to connect 12 smart cities with the maritime hubs at an estimated cost of Rs 50,000 crore (US$ 7821.05 million).
- Smart armed force stations (SAFS): There is a proposal to develop 6 smart armed force stations (SAFS). Of the 6 stations; 3 will be army stations, 2 of airforce and 1 of the navy.
- Smart aerotropolis: The West Bengal government plans to develop first airport city called the Bengal Aerotropolis Pvt Ltd (BAPL) at Andal in Burdwan district.
- Smart railways: Ministry of Railways has introduced world-class station programme to upgrade and revamp the existing railway stations. New Delhi Station will be the first station to be redeveloped within this programme spread over 86 hectares land with 18 platforms to handle in excess of 500,000 passengers per day. The Surat railway station is also to follow with 2.27 lakh square metre for redevelopment of new station. Along with this a total of 1,052 stations have been identified for upgradation of passenger amenities. It is proposed to include 200 more stations under this scheme.
- Smart villages: Saansad Adarsh Gram Yojana (Parliamentarian's Model Village Scheme aims to ensure holistic development of identified gram panchayats. Under this programme, Andhra Pradesh is the first state to launch the 'Smart Village' plan aimed at making AP, a top state in the country by 2029.
- DMIC: The Delhi Mumbai Industrial Corridor (DMIC) running through six states Delhi, Western Uttar Pradesh, Southern Haryana, Eastern Rajasthan, Eastern Gujarat, and Western ans to build a dedicated freight corridors along the Delhi-Mumbai. The cities that have been identified are Dholera in Gujarat, Shendra-Bidkin in Maharashtra, Greater Noida in UP, Ujjain (MP) and Gurgaon in Haryana.
- SEZ: Guizhou International Investment Corp (GIIC) has signed an MoU with Kakinada SEZ (KSEZ), a subsidiary of GMR Infrastructure to develop industrial park over 2,000-acre land for setting up Chinese high-end equipment manufacturing plants. GIIC will invest $500 million in developing the infrastructure and various facilities of the industrial park. These Chinese companies will invest $2-3 billion in setting up their operations over the next 5 years and generating more than 5,000 jobs for both skilled and unskilled workers.

Conclusion:

Smart cities are necessary not only to reduce emissions, but to handle the rapid urbanization growth that the world is experiencing. Inefficiencies in urban areas bring large negative environmental and social impacts. City infrastructures are the backbone of the cities, delivering the necessary services to the population and creating the conditions for citizens to develop their professional, social and cultural activities. Infrastructures are also quintessential in guaranteeing

the city's resilience to environmental risks. Until now city infrastructures have been built independently and operated separately in parallel silos (water supply, electricity, transport). Furthermore, the citizen has mainly been a consumer of services with little direct infl uence on the system. In a smart city, this needs to change. First of all, effi ciency requires that infrastructures are appropriately interlinked horizontally. Secondly, citizens are becoming producers and service providers. In the area of energy, individuals are starting to produce energy from renewables and thanks to the data revolution, also to deliver information and services in a number of areas.

With smart systems, goods owned by citizens can be active in improving effi ciency. Smart meters and electric cars can interact with the grid, data produced by the smart applications of the citizens can contribute to traffi c control, improve emergency response, etc. Citizens can also use the technologies to sell new services. This change in cities needs to be accompanied by enabling conditions, which means reforming the ways cities are governed and financed, i.e. administrative reforms and new financial systems. However, the glue allowing infrastructures to link and operate efficiently are standards. Standards are necessary to ensure interoperability of technologies and the transfer of best practices. But standards are not yet adapted to the level of technology integration we are requiring. Standard bodies still operate in sectorial parallel silos, developing standards which are not easy to understand by non-specialists, particularly city managers. Standards are facilitators for city planners, and they need to incorporate standards in planning and procurement. There is thus a need to reform the way standards are produced, ensuring those are adapted to the needs of the city planners and other service operators within the city.

There is a need for close collaboration between standard bodies themselves and collaboration with outside organizations, in particular the city planners.

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