Urban Sociology
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Module 3 – Smart cities and Urban life

Lecture 11

Smart Cities – Global perspective and Indian perspective

A warm welcome to all. Today we will be discussing what are smart cities and the global and Indian perspectives.

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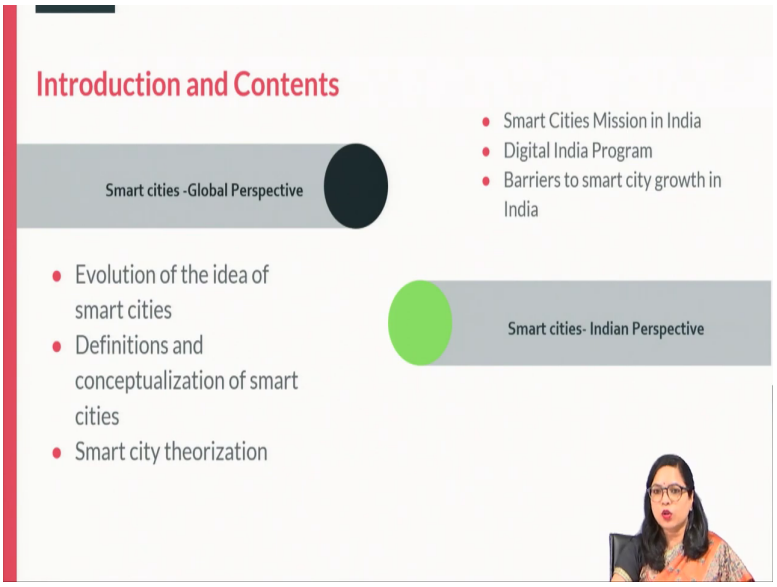

The contents that we will be covering today are an evolution of the idea of the smart cities, the definition and the conceptualization of smart cities, smart cities theorization, Smart City Mission in India, then we will be discussing the digital India program and we will conclude with a discussion on barriers to the smart city growth in the Indian perspective.

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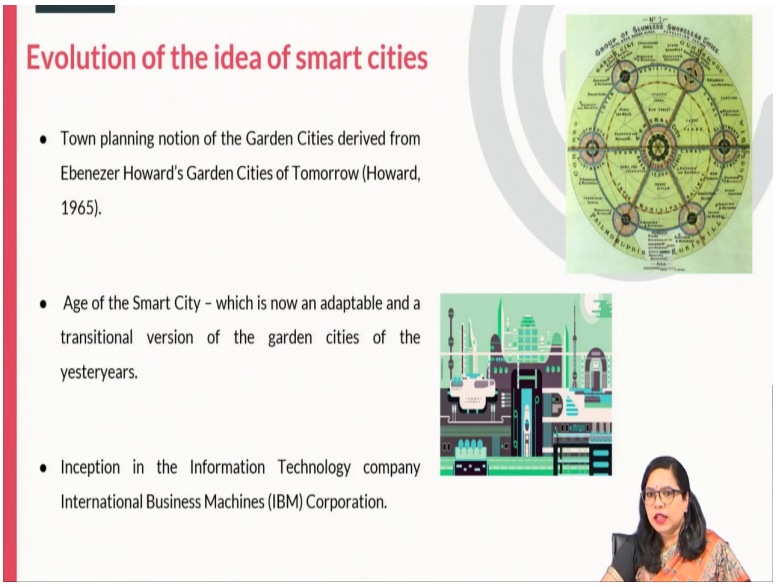

The idea of a Smart City is not a novel creation of the 20th century itself. Rather it has evolved through time and space. It has its roots planted in the initial conceptualization of the town planning notion of garden cities that was derived from Ebenezer Howard's Garden Cities of Tomorrow.

According to Hugel, a century after the garden cities of Letchworth and Welwyn, we have now stepped into the age of the smart city, which is now an adaptable and transitional version of the garden cities of the yester years. It is in its modern form. Smart City has its inception in the information technology company that is International Business Machines, IBM Corporation credited to its CMO, credited to its CEO, Samuel J. Palmisano.

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According to Kumar smart cities came to be discussed as a new generation of acknowledged economic investment. And this tardily evolved into the present connotation of what we now termed as Smart Cities.

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Scholars have established that continuous migration to the cities has given rise to 54 percent of the world population to confine over 4 percent of the terrestrial surface. As predicted by the United Nations 6.5 billion of the world's population will be living in the cities by 2050. According to Hyat in his article smart cities a global perspective, this continuous migration over the year has made cities densely populated and congested, as almost 54 percent of the population of the world is confined to about 4 percent of the terrestrial surface. Further, the global urban population is forced to rise to 70 percent by 2050.

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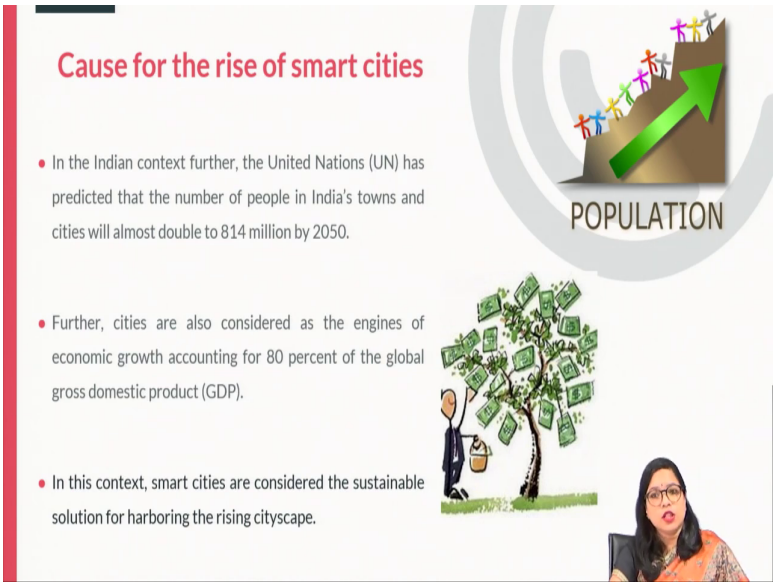

In the Indian context, the United Nations has predicted that the number of people living in India's towns and cities will almost double to 814 million by 2050. Further cities are also considered the engines of economic growth, accounting for 80 percent of the global gross domestic product, or the GDP. In this context, smart cities are considered the sustainable solution for harboring the rise or rising cityscape.

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Given the background the definition of the term smart city is ambiguous due to its variable nature, differing from country to country. This variability depends on the graph, geographical condition, ecosystem, resource availability, and major challenges being faced. However, according to Cohan smart cities use information and communication technology to be more

intelligent and efficient in the use of resources, resulting in cost and energy savings improved service delivery and quality of life, and reduced environmental footprint, all supporting innovation, and the low carbon economy.

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Smart Cities have seen an explosion in the writings with rising technological advancement as well as the constant escalation of urbanization. Some examples of Smart Cities are Singapore, Songdo, Amsterdam, Santander, Chicago, Rio de Janeiro, San Francisco, and Auckland.

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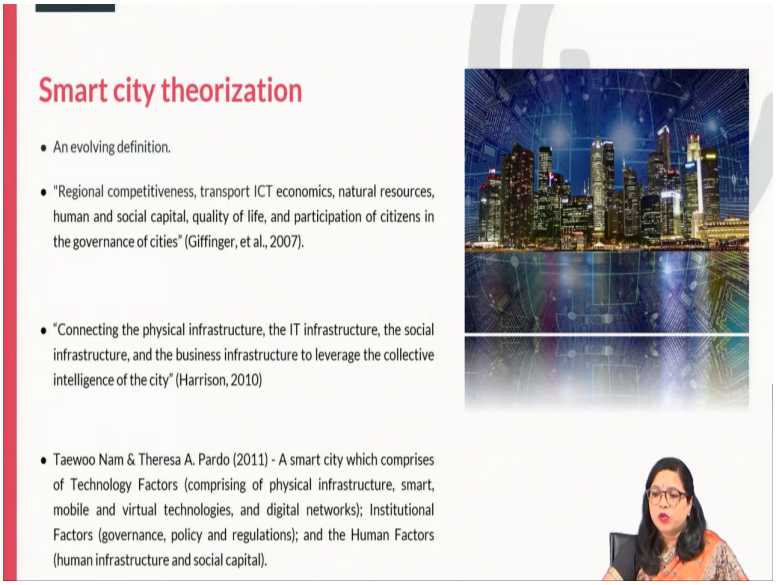

One of the most debated aspects of a smart City is that of developing and universal definition. However, the definition of smart cities always evolving. According to Giffinger and others regional competitiveness, transport, ICT economies, natural resources human and social

capital, quality of life, and participation of citizens in the governance of the cities categorize a city as a smart city.

Some further formulated the definition of the smart city as those that are concerned that concern it to connecting the physical infrastructure, the IT infrastructure, the social infrastructure, and the business infrastructure to leverage the collective intelligence of the city as Harrison puts it.

To explain the idea Taewoo Nam and Theresa A. Pardo in a comparatively recent and comprehensive study stated certain fundamental elements of a smart city which comprise the technological factor like comprising of the physical infrastructure, smart, mobile, and virtual technologies along with digital networks, institutional factors which comprise of the governance policy and regulation, and the human factors such as the human infrastructure and the social capital.

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According to Pellicer, a scheme was proposed by the center of regional science at the Vienna University of Technology in the publication ranking of European medium size cities under the certain aspects that make the concept of smart cities have been proposed. And they are first the smart economy which is competitiveness which focuses on the aspects of innovative spirit, economic image and trademark, entrepreneurship, productivity, the flexibility of labour market, international embeddedness, and ability to transform.

The second is smart governance which this aspect is concerned with public participation through decision making, public and social services, political strategies and perspective, and

transparent governance. The third consists of the smart people or the social and human capital like sustainable cities require human capital for their growth, like the level of qualification, affinity to lifelong learning, social and ethical plurality, flexibility, creativity, and participation in public life are all essential elements under this aspect.

The fourth comprises Smart Mobility. Since transport is vital, even though they do not support a sustainable system like climate change, or the local emission or noise, congestion, and accidents. That is why new transport technologies and management systems for urban traffic are being researched by smart cities to bring about more sustainability.

The Fifth element is the smart environment. In this context, aspects of energy efficiency and resource management play an important role. These attributes help manage pollution, and environmental protection, and give rise to sustainable resource management.

The sixth is smart living, the new smart city application to improve the citizen quality of life, are cultural facilities, health conditions, individual safety, housing quality, educational facilities, tourist attractivity, and social cohesion. These are all the concerns that arise from services that support a cultural agenda alongside catered to the aspects of education and health as well.

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Neirotti and others had delineated a taxonomy of some particular domains in which the concept can be applied somewhat universally. These include the form of four groups of contextual conditions that have key importance on the resource and the needs of investing in

smart cities, which they claim can summarize the relevance of the development of smart cities globally.

These include first the structural factors, including the size and the demographic density, second the economic development, then comes technological development, and lastly, the environment-friendly policies. When these were analyzed over 70 cities of the world the following six domains evolved to be of relevance, including natural resources and energy, transportation and mobility, building, living, government and economics, and people.

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Hard domains of Neirotti which directly influenced sustainability such as buildings, energy grid, natural resources, energy and water management, waste management, environment, transport, mobility, and logistics are given more value over the soft domains such as education, policy, social inclusion and measures of E-governance, making a largely technical inclination of the effects of the Smart Cities.

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For Komninos Smart Cities can be depicted as multi-layer edifice, and while these layers are common among all smart cities, their components tend to differ accordingly. He constructed the three layers as the interaction or the city layer and interface or the smart environment layer and an information or the knowledge layer.

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The city layer here comprises the population and its knowledge-based interaction with the infrastructure. The interface layer consists of the real-time function of the E-services, broadband networks, and the application while the knowledge and the information layer connotes the institution involved in the knowledge flows and research and innovation. Which

Komninos describes as the critical factors of institutional thickness, social capital for collaboration, trust, and knowledge spillovers within the city.

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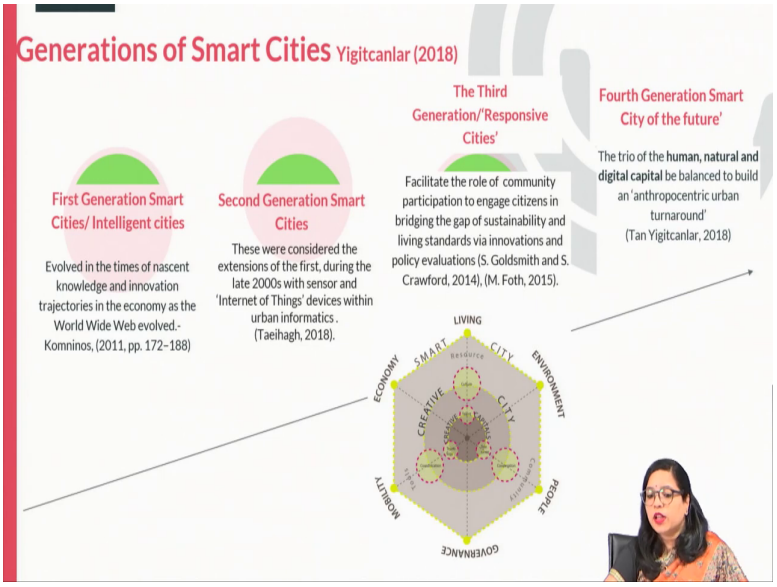

According to Tan Yigitcanlar, there has been a stage-wise division of cities which are given as the first generation to the fourth-generation cities in alliance with the time and technological processes to bring in the universal categorization between the Smart Cities. They are the first-generation cities that are termed the intelligent cities by Komninos that simply cover the times of initial knowledge and innovation trajectories in the economy and the evolution of the world wide web.

The second-generation smart cities which were considered the extension of the first during the late 2000s, with sensors and the Internet of Things, devices inculcated into urban informatics according to Taeihagh. The third-generation smart cities are termed the responsive cities according to Goldsmith and Crawford, which facilitate the role of community participation in engaging citizens in bridging the gap of sustainability. Hence, as stated by Yigitcanlar and other smart cities of the present are far away from achieving the high pedestal of the fourth-generation aspect without an anthropocentric urban turnaround.

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Thus over the three decades, city theorization has transitioned from being specific to being generalized by some common factors. Now, let us contextualize the smart cities in the Indian context. India is moving towards creating 100 Smart Cities through its Smart City Mission. The Smart City Mission was initiated in India in 2015 as a government initiative, the Ministry of urban development government of India has defined smart cities as follows.

In the imagination of any city dweller in India, the picture of a smart city contains a wish list of infrastructure and services thus describing his or her level of aspiration. There are four pillars of the smart city comprehensively, the institutional, physical, social, and economic infrastructure.

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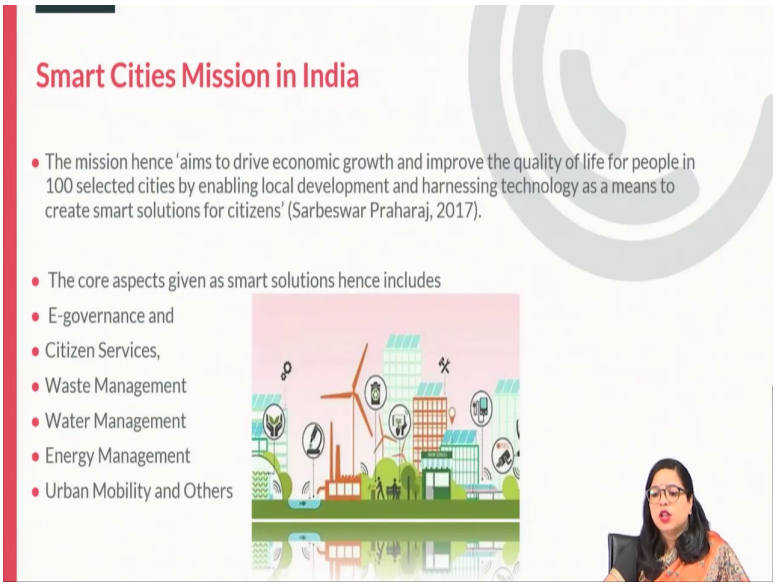

According to Sarbeswar Praharaj, the mission hence aims to drive economic growth and improve the quality of life for people in 100 selected cities by enabling local development and harnessing technology as a means to create smart solutions for the citizens. The core aspects are given as the smart solution hence including E-governance and citizen services, waste management, water management, energy management, urban mobility, and others.

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According to Hoelscher, the evolution of Indian Smart Cities took a turn that can be based on financial technocratic and governance capacities. Smart cities in India are largely concerned with both private and public interests, while using the language of the smart city to build privately owned and government, privately owned, and governed cities on greenfield sites often in the special economic zones or SEZs.

Such private sector-oriented evolution of the Indian Smart Cities has its roots in the program like the mega city scheme 1993, the JNNURM 2005, the Delhi Mumbai Industrial Corridor, a project of 2006 investment reason, and the special economic zones are the SEZs of 2006. These programs laid the foundation for the intrapreneurial nature of the Smart City Mission and the Digital India program.

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The strategic component of area-based development in the smart city mission includes city improvement in the form of retrofitting, city renewal or redevelopment, and city extension in the form of greenfield development. Additionally, a pan-city initiative in which smart solutions are included covers a large section of the concerned smart cities.

Retrofitting considers the modification of an existing built-up area based on the Smart City objective, making it efficient and liveable, covering an area of more than 500 acres. In the case of Smart City renewal, in the form of free development, the replacement of the existing built-up environment takes place with enhanced infrastructure.

Redevelopment covers an area of more than 50 acres which are identified by the Urban Local Bodies are the ULBs in consultation with the citizens. Greenfield development on the other hand introduces smart solutions in vacant areas of more than 250 acres using innovative planning as well as land pooling or reconstruction. These occur around cities to support the expanding population.

Pan city development envisages this application of selected smart solutions applied to the already existing city-wide infrastructure such as in the transportation and automation sectors or the wastewater recycling, and smart metering processes within the water management systems within the smart cities.

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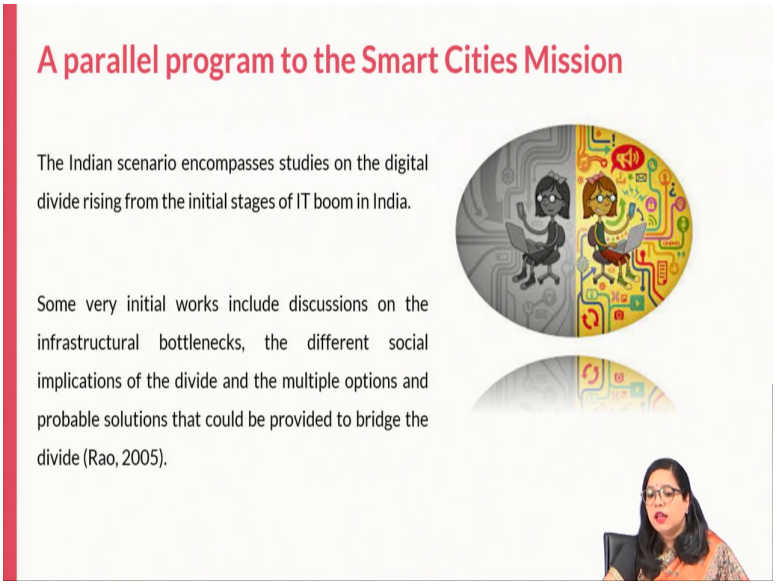

The Indian scenario encompasses studies on the digital divide rising from the initial stages of the IT boom in India, some very initial works include discussion on the infrastructural bottlenecks, the different social implications of the divide, and the multiple opinions and

probable solutions that could be or that could provide to be the or that could be provided to bridge the divide.

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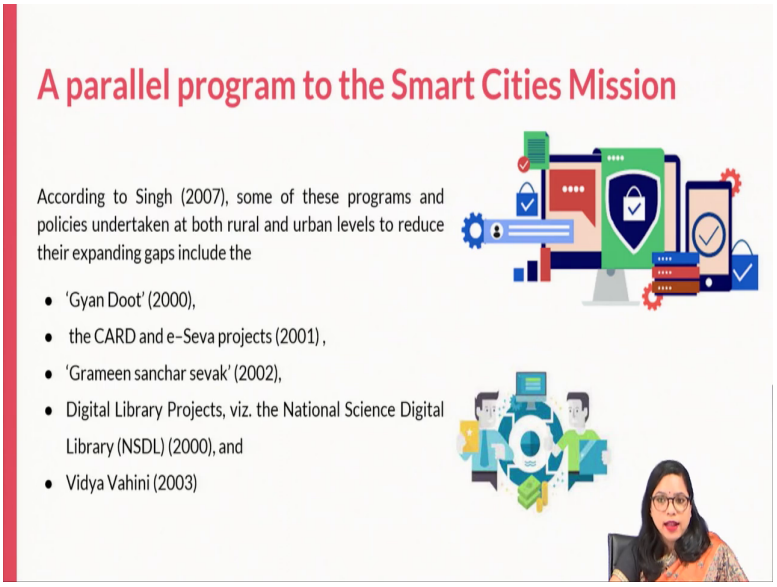

According to Singh some of the programs and policies are undertaken at both the rural and urban levels to reduce their expanding gaps including the Gyan Doot, the CARD, or e Seva project. The Grameen Sanchar Sevak, Digital Library Project, National Science Digital Library and Vidya Vahini, digital mobile libraries and library network, and the community information centers.

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With a vision to transform India into a digitally empowered society and knowledge economy. It incorporates multiple government ministries and departments where its overall

coordination is considered to be done by the Department of Electronics and Information Technology.

The estimated cost of the project is around 1 lakh 13,000 crores the Digital India advisory group is chaired by the cabinet secretary and monitored by the Prime Minister and his office. There are 9 pillars to the Digital India program, which we will discuss briefly, let us discuss.

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Table 1. Table depicting the nine pillars of Digital India Program.

Pillars of the Digital India Program	Functions of the Pillars
1. Broadband Highways (32,000 Cr. Funds allocated)	1. Broadband for all rural: Aims to cover 2.5 lakh villages across India 2. Broadband for urban: Virtual network operator for service delivery and mandate communication infrastructure on new urban development and buildings. 3. National information infrastructure: Aims to integrate SWAN, NKN, NOPN.
2. Universal Access to Mobile Connectivity (Rs 16,000 Cr funds allocated)	Provide internet connectivity through mobile phones within FY2014-18.
3. Public Internet Access Program	Post Offices to be considered as Multi-service centres
4. E-Governance: Reforming Government through Technology	Reform government business process with improved transaction and Electronic databases.

The first one comprises the broadband highways, like the broadband for all rural areas, broadband for urban areas National Information Infrastructure, National Information Infrastructure which aims to integrate the NKN and NOPN, the second is the universal access to the mobile connectivity which aims to provide internet connectivity through the mobile phones within the FY 2000 the year 2014 to 2018.

The third one is public internet access programs like post offices to be considered as multi-service centres, which will function as the pillars. The fourth one is e-governance reforming the government through information and technology like reforming government business processes with improved transactions and electronic databases.

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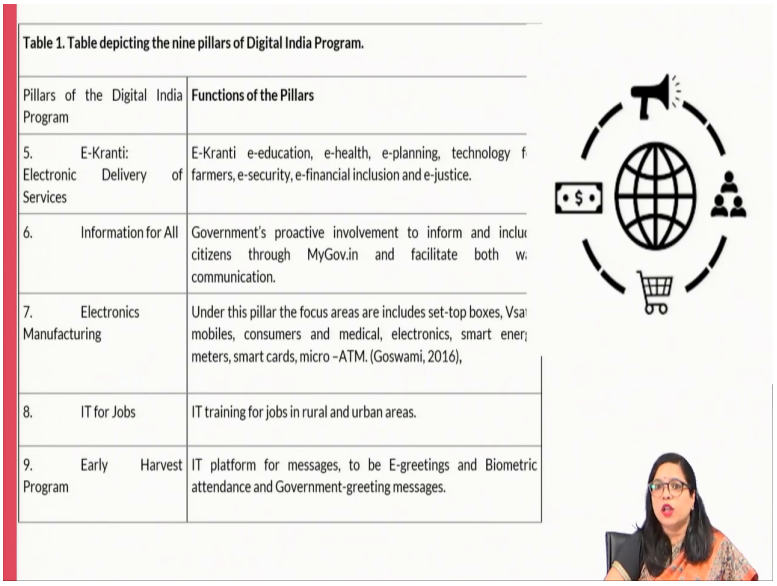

The fifth one that comprises the pillar of the Digital India program is the E Kranti. Or the electronic delivery of the services which include e-education, e-health, e-planning, and for e-security or e-financial inclusion and e-justice. The sixth one includes the information for all like governments proactive involvement to inform and include citizens through the MyGov.in and facilitate the communication is something that covers under or comes under this.

The seventh one is electronic manufacturing under this pillar, focus areas are the, are the focus areas which include are the set of boxes, the mobiles, consumers and medicals, electronic, smart card, micro ATMs, and IT for jobs is the next one. For example, here the pillar comprises IT training for jobs in rural and urban areas.

And the ninth pillar of the Digital India program is considered to be the early harvest program here IT platforms will be created for messaging to be e greeting or biometric attendance and government greeting messages. So, these are the nine pillars of the Digital India program and the functions that aim at building up Digital India.

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Barriers in governance like these comprise a lack of cooperation and coordination between the city's operational network, unclear IT management vision, political instability, lack of trust between the governed and the government, poor private-public participation, lack of development, and a common information system model.

Economic barriers include the high IT infrastructure and intelligence deficiency, lack of competitiveness, cost of IT training and skill development, global economic volatility, and higher operational and maintenance cost. The text includes the social barrier which comprises a lack of involvement of citizens, the low awareness level of the community, geographical diversification problems, and degree of inequality.

The technological barriers include the lack of technological knowledge among the planners, lack of access to the technology, privacy and security issues, system failure issues, integration and convergence issues across the IT network, and poor data availability and scalability.

The next comprises the environmental barriers these comprise the lack of ecological view in behaviour, growing population problems, lack of sustainability consideration, carbon emission effects and degradation of the resources. The next consists of the legal and ethical barriers, these include cultural issues, lacking standardization, issues of openness of data, lack of transparency and liability, and lack of regulatory norms, policies, and directions. These are responsible for the lags that are visible in the growth of Indian smart cities across.

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Having covered the smart city context we will discuss other attributes that play an essential role in an urban context, which is the social interaction and this concept will be addressed in the next lectures. Thank you for listening and have a great day ahead.