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Review Paper

An insight into upcoming Smart City Jammu: A vision full of challenges towards making a city smart

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Abstract

Due to India's dynamic population and migration from rural to urban regions, policymakers are required to find solutions to different issues such as pollution, overcrowding, crumbling infrastructure, financial limits, and resource constraints in order to continue growth. To combat these issues government initiated the flagship program of Smart Cities (SC) but the current narrative about Smart Cities is upgraded to Sustainable Smart Cities (SSC) owing to various difficulties, as it simply identifies cities with strong potential for smartness. Second, it ignores the city's role in resource management. In this article, we offered a brief assessment of the major smart city story components encountered during the building of Jammu Smart City (our study area) from July 2020- June 2021 as presented and pointed out the insignificance from the reality and from the sustainability of cities described by systemic thoughtfulness. This article outlines the numerous projects now underway in Jammu towards the implementation of a smart city, as well as the impediments in their implementations. Since 2015, Indian government has been committed towards developing and constructing 100 Smart Cities under the Ministry of Housing and Urban Development to address the demands of its fast rising and urbanising population. This endeavour will encompass the creation of new municipalities as well as the augmentation of previously existent setups and renovation of existing cities. Smart technologies powered by the Internet of Things (IoT) can aid in mitigating the threat posed by urbanisation. The concept of smart city implementation in Jammu was included under the smart city banner during the third round of smart cities proposal in 2017-18, so the challenges associated with it along with the significant areas for the build out of smart city Jammu are presented briefly.

Keywords: Augmentation, Internet of Things (IoT), Resource Management, Smart economy, Smart city, Smart solutions.

Introduction

Smart phones and smart technology have assisted humanity in resolving some of its problems in this contemporary era. On a similar vein, "smart city" is a futuristic and sustainable method of overcoming the challenges posed by ever-increasing population and rapid urbanisation, which will benefit both governments and the general public[1]. After the completion of the (JNNURM) Jawaharlal Nehru National Urban Renewal Mission in 2014, India's newly elected government at the centre opted to initiate new measures in similar concept. The Atal Mission for Rejuvenation and Urban Transformation (AMRUT) was initiated to focus on the development and extension of existing infrastructure and sewage networks. But the smart city mission received much more attention than the AMRUT because it is apparently a bold new initiative unlike the AMRUT, which only finances the large cities (more than 1,00,000 inhabitants) but cities of all sizes can compete for the "smart" city label[2]. Furthermore, cities chosen for smart city implementation must establish an ad hoc governance instrument in the form of a special purpose vehicle (SPV) for project planning, execution, and monitoring.

Cities must compete on the basis of proposals submitted to the nodal agency in two phases, with state governments submitting a list of cities to the federal government in the first. Based on a set of criteria and other elements such as the strength of institutions and local finances, as well as the demonstrated ability to carry out the smart city mission in the city. Nonexistence of some essential features in modern cities like good quality of life and sustainable economic growth can only be provided by the implementation of smart cities[3]. Smart cities are an effort to make cities more efficient, sustainable, and livable in accordance with the Sustainable Development Goals (SDG). As a part of smart city all key infrastructures are monitored and integrated like drinking water supply, roads, hospitals, airways, rivers, communication power supply etc[4]. Unplanned urbanisation and non-implementation of master plans in India is a major concern particularly for the infrastructure and providing services to its citizens[5].

Most peri-urban and non-municipal regions are "no governance" zones since they are neither rural nor urban and always vacillate between municipal and non-municipal boundaries. To overcome this gap and integrate all public domains in better way finance minister Late Sh. Arun Jaitleyal located 7600 Crore ($1.24 billion USD) in the government's first budget, which was presented in the Parliament in July 2014. A smart city integrates various sectors like IT (information technology), telecommunications, urban planning, improved health care, smart infrastructure, and operations in a way that optimises the city's in habitant's quality of life[6]. It is supported by three pillars like infrastructure, operations, and people. Since 2018, two smart cities projects in Jammu and Kashmir have been implemented: Srinagar Smart City and Jammu Smart City. We highlighted the problems encountered during the execution of various projects in the sectors like health, social, management, economic, legal, technology, and sustainability. This study paper investigates the many features, dimensions, and issues associated with the advancement of Jammu smart city and emphasises how these components may help make the smart city initiative a successful project in Jammu City.

Materials and Methods

The current study was investigative in character, with pertinent materials being acquired largely through visiting the actual location of projects being implemented, as well as from other secondary data sources, such as journals, books, websites, papers, and so on. Although the characteristics of Smart Cities vary from city to city, they may be generically classified into six major axes or dimensions. Smart Economy, Smart Mobility, Smart Environment, Smart Governance, Smart People and Smart Living[7]. In the study area (Figure-1) these parameters were taken into consideration and the efforts being taken were documented and classified[8]. These aspects are classified and illustrated in Table-1 based on conventional, local, and classical ideas of urban development and growth. The axes are often based on regional competitiveness, economics of transportation and ICT, natural resources, human and social capital, quality of life, and public participation in municipal management. Our study is also based on the generalized key building blocks of Smart City[9] these are: i. Smart Energy: Implementation of solar lights, smart meter, smart grid station, use of renewable energy as gas distribution. ii. Smart Mobility: This includes mass public transport like metro or light rail system, Intelligent traffic management system, Electric Vehicles, GPS enabled smart cycle sharing system and Intelligent charging points across cities. iii. Smart Water: This includes storm water management, smart water meter system (SCADA), integration of more efficient Sewerage Treatment Plant (STP) for grey water recycling. iv. Smart Public Services: includes public safety, healthcare, Education and Public. v. Smart and Affordable Buildings and Homes: Solar powered lights and energy efficient building and homes. vi. Smart integration: This includes integration of information between different cities departments for real-time visualization, management and analysis of incidents across the city.

Results and discussion

Jammu smart city has completed over 43 projects, 98+ projects are still ongoing and more than 40 projects are in pipeline. Some prestigious projects include Tawi river development project, Multilevel parking, development of smart cycle pathways, smart pole and lightning system, e-rikshaw, IT based smart parking system, vertical gardens, Integrated Traffic Management System (ITMS), GPS enabled vehicle for waste collection, two bin segregation dustbin, refuse compactor, solid waste management system, development of green spaces, beautification of city etc. An amount of Rs 195 crores is allotted to Special Purpose Vehicle by government of India and the roadmap/vision towards making Jammu smart is shown in Figure-2 and some photographs showing projects going on are shown in Figure-3. The successful implementation of smart city solutions requires operational coordination between various institutions providing various municipal amenities, as well as efficient coordination between central government, state government, and local government agencies on various issues related to financing and sharing of best practises and service delivery processes[10].

There are few sectors in Jammu which possess some challenges for Jammu in becoming the Smart City these are:

Healthcare: Jammu is the main healthcare hub of the region where the needs of neighboring districts like as Doda, Kishtwar, Ramban, Reasi, Rajouri, and Poonch are aided. However, in other circumstances it lacks even the most basic infrastructure and human needs as there are very few government hospitals which operate high-tech infrastructure and instruments required for the city's population.

Education: i. Despite the fact that colleges in Jammu have exceeded the college population index in terms of student's enrolment threshold, but recently government has established many colleges to overcome this issue for delivering quality education in the region. ii. There are eighteen government degree colleges in the Jammu District that are adequately equipped, however the laboratories are required to be turned into simulated labs. There is shortage of faculty in some colleges, particularly in science subjects whereas in multidisciplinary subjects like environmental sciences there are only two universities with limited enrolment seats that offers postgraduate and doctoral degrees in environmental sciences, resulting in a lack of awareness about environmental education. iii. University of Jammu ranked among the top 100 position at national level in NIRF, but the research infrastructure lacks good funding. It is yet to come up with smart classrooms but recently to make it ecofriendly campus solar panels are getting installed inside the campus.

Solid Waste Management: i. The Jammu Municipal Corporation spend lakhs on garbage-lifting vehicles, dustbins, and waste collection rehris but fails to adopt a long-term trash collecting and segregation plan at the home and disposal levels. As a result, recyclable rubbish is thrown in open areas and dumped at disposal sites without being treated. In addition, bio-medical waste management is ineffective in the city. ii. Jammu produces 350 tonnes of trash each day and after recycling and treatment the waste goes to the dumping ground at Bhagwati Nagar and newly commissioned at Udeywalla[11]. iii. JMC has employed only two sanitation officer and 1481 permanent safai karamcharis[12] although the need base labors are employed but to improve the efficiency the wages and other issues are yet to be resolved.

Traffic regulations: Traffic control in Jammu is difficult due to the 7.24 million vehicles on the road and the daily use of 1.8 lakh four-wheeler vehicles and cars on city highways by the people of surrounding areas[13].

Transport Service: i. There are just private local buses and autos available in Jammu City. There are no government buses operating, with the exception of a few routes, and the bus service working hours on the majority of routes are up to 9 p.m. and even earlier during winters. Electric vehicles are now being used in smart city projects. ii. No user-friendly bus route information system is available in the city. In order to travel at multiple locations, a passenger requires to shift two or more buses in addition absence of route plans creates problems for the tourists. Although bus numbers and routes are shown on each vehicle but the time it will take to arrive at its destination is not marked. In addition, there is no smart phone application that informs passengers about bus routes and shelters, as well as the bus timetable. iii. There is no metro or any other light rail concept implemented in the city despite its expansion and urbanization. There are a few recommendations regarding where the government should concentrate its efforts in order to manage smart cities in the country as well as in Jammu:

High quality streets and public spaces: It may be advantageous to the local economy, connections, culture, creativity, and future improvements to build the urban infrastructure with carefully considered roadways and the establishment of public green areas. A good road system will be efficient for public transportation, as well as pedestrians and cycle riders. At least half of the land should be used for public space before any infrastructure is built; 30% should be set aside for roadways to create well-connected grids; and 20% should be devoted to parks and open spaces.

Urban applications and resource uses: Properurban planning such as in Gandhi Nagar, Channi Himmat and Banta lab areas could help to create local employment opportunities by reducing car dependency by encouraging cycling at local level and use of other non-motorized transport thereby reducing landscape fragmentation and greenhouse gas emission thereby leading to safer societies and creates beautiful neighborhoods.

Connectivity: Improved connectivity aims to strengthen regional economies while giving everyone access to basic services like the internet. This encourages accessibility to Information and Communication Technology (ICT) which promotes operational efficiency.

Capacity Building Programme/TULIP Internship: The Urban Learning Internship Programme (TULIP) and CBP are required for the development of smart city. Due to the lack of quality manpower both at the centre and state levels some ambitious projects are delayed. Regarding this researcher from universities and industrial people may be contacted for internships and assigned to capacity development initiatives that emphasize training, contextual research, information sharing, and framing of a robust database.

Waste management: Waste collection and management should be done according to solid waste management rule (2016) which focuses on waste to energy generation rule.

Urban adaptability: Infrastructure should be planned in accordance with the many policies on disaster management and preparedness methods, frameworks, plans, and designs that support both adaptation to climate change and for the abatement of greenhouse gases emissions.

Energy and Resource Efficiency: This necessitates utilizing the services of smart technology to manage the excessive consumption of power and other resources in a sustainable manner. Cities may reduce their environmental effect through appropriate strategic planning through the development of regulations[14] and initiatives focused on buildings, appliances, transportation, and agriculture.

Realistic and enforced standards and guidelines: It is essential for the government to come up with policies, plans, norms and rules in consultation with municipalities to cope up with the fast urban growth which the cities are experiencing. The ideals of equality and social cohesion for the citizens should be the foundation for the participatory approach used to establish the guidelines and standards.

Conclusion

As India sets out on an ambitious mission to modernize the way that cities look, function, and are designed, policies are being considered. It is imperious that smart cities should be planned and built using the most recent technological breakthroughs so that millions of people's lives might be revolutionized by an extensive urbanization plan that focuses on improved access and transportation, outstanding urban design, equitable land management, and concurrent policy frameworks.

Table-1: Theoretical components of smart city proposed by Giffinger[8].

Smart Economy (Competitiveness)	Smart People (Human Capital)	Smart Living (Quality of Life)
• Innovative spirit • Entrepreneurship • Economic image & trademarks • Productivity • Flexibility of labour market • International embeddedness •Cooperation between the public and private sectors • City competitiveness	•Level of qualification • Flexibility • Capability standard • Creativity • Affinity to lifelong learning • Social and ethnic plurality • Cosmopolitanism or Open mindedness • Participation in public life •People with professional Techniques • Intelligent government	•Cultural facilities • Medical service • Health conditions • Housing quality • Individual safety • Education facilities • Touristic attractivity • Social cohesion •Intelligent green building sustainable groups
Smart Governance (Participation)	Smart Mobility (Transportation)	Smart Environment (Natural Resources)
•Public participation in decision-making • Transparent governance • Digital Infrastructure • Public and social services • 24×7 Emergency System • Political strategies & Perspectives • Policies & Regulations • Urban digitalization • Urban monitoring and measuring	• Travel choices • Local accessibility • (Inter-) national accessibility • Availability of ICT infrastructure • Innovative and safe transport systems • Improving transportation congestion, energy conservation and carbon reduction	• Attractivity of natural conditions • Air Pollution • Environmental protection •Sustainable resource management • Energy conservation & Renewable energy • Decrease in the amount of waste and the number of trash trucks

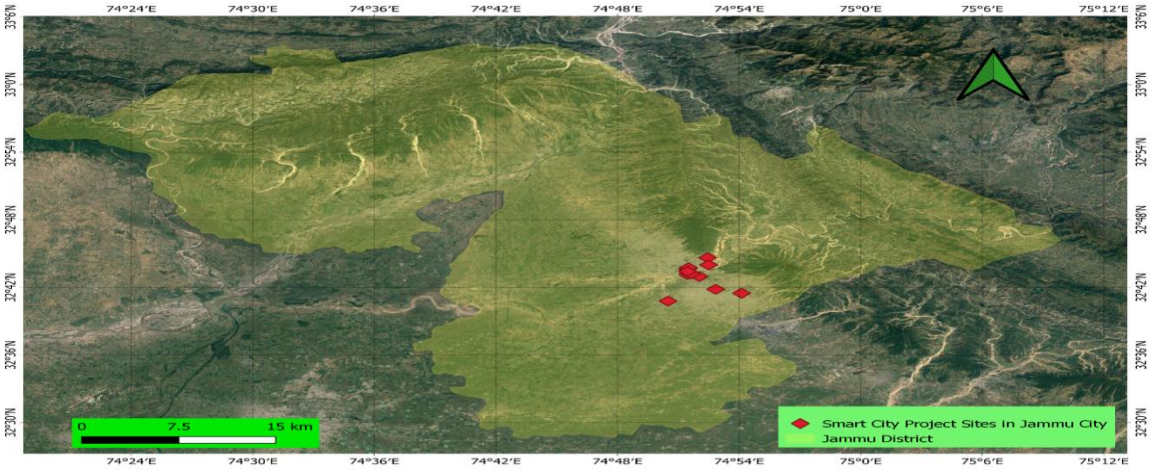

Figure-1: Map showing locations of Projects in Jammu city.

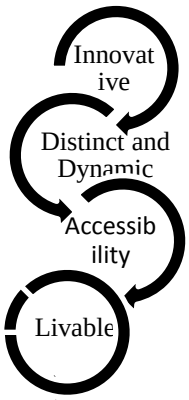

Figure-2: Vision and outcomes of Jammu Smart City.

Figure-3: Some ongoing Projects executed under Jammu Smart City*.

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References

1. Aishwarya, N., Chellasamy, A., & Bhagat, S. (2021). Smart City-Far and Near Dream in Indian Context. *Int. Journal of Computer Applications*, 174(12), 25-31.

2. Su, K., Li, J., & Fu, H. (2011). Smart city and the applications. In 2011 international conference on electronics, communications and control (ICECC). 1028-1031. IEEE.

3. Rocco, P., Carmela, G. and Adriana, G. (2013). Smart cities: Researches Projects and good practices for the cities. *Journal of Land Use, Mobility and Environment*, 5-17.

4. Tiwari, A., & Jain, K. (2014). GIS Steering smart future for smart Indian cities. *International Journal of Scientific and Research Publications*, 4(8), 442-446.

5. Singh, K., & Sharma, N. (2016). Smart cities in India: Key areas and challenges-case study of Chandigarh City. *International Journal in Management & Social Science*, 4(1), 386-396.

6. Browne, N. J. (2020). Regarding smart cities in China, the North and emerging economies—One size does not fit all. *Smart Cities*, 3(2), 11.

7. Chourabi, H., Nam, T., Walker, S., Gil-Garcia, J. R., Mellouli, S., Nahon, K., ... & Scholl, H. J. (2012). Understanding smart cities: An integrative framework. 45th Hawaii international conference on system sciences, 2289-2297. IEEE.

8. Giffinger, R., Fertner, C., Kramar, H., Kalasek, R., Pichler-Milanovid, N. and Meijers, E. (2007). Smart Cities: *Ranking of European Medium-Sized Cities*. Vienna, Austria: Centre of Regional Science (SRF), Vienna University of Technology.

9. Ramaswamy, R., & Madakam, S. (2013). The state of art: Smart cities in India: A literature review report. *International Journal of Innovative Research and Development*, II, 12, 115-119.

10. Tcholtchev, N. and Schieferdecker, I. (2021). Sustainable and Reliable Information and Communication Technology for Resilient Smart Cities. *Smart Cities*, 4, 156–176.

11. Central Pollution Control Board (2022). https://cpcb.nic.in/. 04/05/2022.

12. Official Website of Jammu Municipal Corporation (2022). https://www.jmcjammu.org/. 08/06/2022.

13. Motor Vehicles Department (2022). https://jaktrans.nic.in/. 12/03/2022.

14. Ahmed, H.U., Huang, Y., Lu, P. and Bridgelall, R. (2022). Technology Developments and Impacts of Connected and Autonomous Vehicles: An Overview. *Smart Cities MDPI*.5, 382–404.