

Modernization of an Udaipur City into Smart City for Sustainable Development

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Abstract: Smart Cities will endeavour to use technology, information and data to improve infrastructure and services. Smart city is a wave of transformation where people of particular city get all kinds of essential services like drinking water, sanitation, transport, roads, street lights, facility of education, information technology, hospital, garden, parking and hotels, railways, air port connectivity, fire mitigation, including disaster management and better solid waste management plan, so that immaculate cleanliness can be maintained by civic bodies in their respective cities. Citizen centricity is at the heart of making smart cities a reality. Urban local bodies should develop their smart city plan through rigorous analysis of citizen concern and priorities. It is difficult to define smart city since its concept varies from country to country and in India its connotation changes from city to city. It aims at developing the entire urban eco-system, which is represented by the four pillars of comprehensive development institutional, physical, social and economic infrastructure. In the approach of the smart cities Mission, the objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment, and application of smart solutions. The focus is on sustainable and inclusive development and the idea is to look at compact areas, create a replicable model which will act like a light house to other aspiring cities.

This paper focuses on the concept of smart city and also analyses the key performance indicators areas for the development of Udaipur city. It also throws light on the challenges faced by the Rajasthan Government in making Udaipur as a smart city. The methodology adopted in this paper is the collection of data through secondary sources which includes newspaper, internet and books. This paper also highlights the suggestions to overcome the challenges in making Udaipur as a Smart City.

Key Words: Challenges, Government, Management, Smart City, Suggestions, Smart Economy, Udaipur.

1. INTRODUCTION

The people are moving towards cities and half of the world's population lives in cities. World's urban population will be double in year 2050. Present, we witnessed that urban regions contribute nearly 60% of Gross Domestic Product in India, which is estimated to be 74% in the next 15 years. In year 2020, Housing shortage will reach about 30 million dwelling units, 200 million new water connections will be required, 250 million people will have to be given access to sewage, 160 GW of power generating capacity will have to be added and the number of vehicles on our urban roads will increase by 5 times. Present time the urban population in India is 31% of the total population. It's time for the cities to get cleverer to deal this large scale urbanization and discovering new modes to manage complexity, enhance efficiency, cut down the costs and mend the quality of life in the urban regions. In addition to it, the increased mobility in India has created challenge between the cities to pull skilled residents, companies and organizations. Contributing this flourishing civilization, cities must achieve economic, social, and environmental sustainability. This will only be made possible by improving a city's efficiency and this requires the collaboration of infrastructure and services. Being utilized smart cities experience and technology accessible around the world, India can drive the much needed transformation to a nation of smart cities. The firstly includes modernization and overhaul of existing cities, where the focus will be on developing and implementing practical solutions that can work ideally with legacy systems and infrastructure and secondly will include the creation of new smart cities from the ground up by leveraging international best practices.

The Honorable Prime Minister of India Shri Narendra Modi launched smart city Mission on 25 June 2015. He has described these prospective cities as offering a "Very high quality of life comparable with any developed European city." The 100 cities were covered to be developed in Mission Period 2015-2020 as a smart city. There is the list of 97 Cities of India to be developed as smart cities in which Jaipur, Udaipur, Kota and Ajmer of Rajasthan among were qualified the criteria for the smart city Mission and Rs 100 Cr per city for 5 years to be given as grant by Government of India. The Selection procedure of

cities was through competition after evaluation of the smart city proposals prepared through intense citizen consultation by the cities by a Panel of Experts put in place by Ministry of Urban Development.

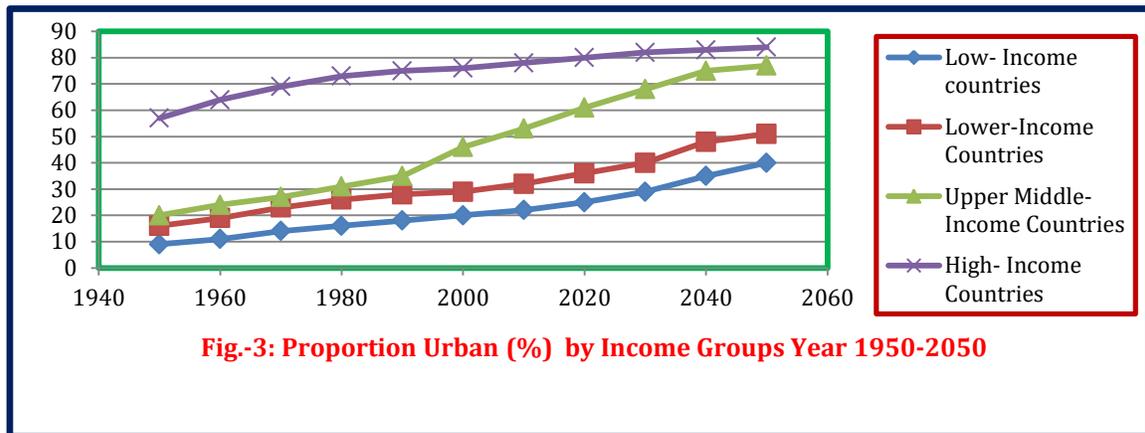


Fig-3: Proportion Urban (%) by Income Groups Year 1950-2050

*UN (2014) World Urbanization Prospects.

2. REVIEW OF LITERATURE

2.1 Inter-National Review:

Alberto Vanolo (July 2013), this paper analyses the concept of the smart city in critical perspective, focusing on the power and knowledge implications for the contemporary city. The paper is mainly based on theoretical reflections and uses smart city politics in Italy as a case study.

Tuba Bakici Esteve Almirall Jonathan Wareham (2013) this paper covers the study of the city of Barcelona and intends to analyse its transformation from a tradition agglomeration to a twenty-first century metropolis. This article analysis is existing literature on Barcelona’s smart city initiative with the Barcelona smart city model. It further explores the main components of the smart city strategy of Barcelona in terms of smart districts, living labs, initiatives, e-services, infrastructures and open data. This paper highlights certain benefits and challenges for such initiative and its future prospects. The outcome indicated that Barcelona has been successfully implementing the smart city strategies to become a role model for the world.

Kehua Su, Jie Li, Hongbo Fu (2011): This paper chiefly concentrates on the recent research on concept of smart city. The relationships between the smart city and digital city are also described in this paper. The various application systems for a smart city are: Construction of a Wireless City, Construction of Smart Home, Construction of Smart Transportation, Smart Public Service and Construction of Social Management, Construction of Smart Urban Management, Construction of Smart Medical Treatment and Construction of Green City.

Smart Cities can be identified along six main dimensions (IBM Smart Cities: www.ibm.com/uk/cities), (Giffinger, R et al, 2007). These axes are Smart Economy - Innovation and Competitiveness , Smart Mobility- Transport and Infrastructure, Smart Environment - Sustainability and Resources, Smart People - Creativity and Social Capital, Smart Living - Quality of Life and Culture, Smart Governance - Empowerment and Participation.

2.2 National Review:

Er. Jashan deep Singh Arora, Er. Navneet Singh (May-June, 2016), explains the various resources required for a city to upgrade into a smart city. According to them cities should be well planned which can provide environmental effectiveness and technological sound services for the well being of its citizens. A smart city can solve the problem of transportation, pollution, unemployment and provide business opportunities to the people.

Kuldeep Singh, Neha Sharma (2016) this paper highlights a holistic approach focusing all three pillars of a Smart City namely Infrastructure, Operations and People. Smart solutions can be beneficial in mitigating the ever increasing population in the

cities. This paper focuses on the concept of smart city in the country and also concentrates on the challenges as well as the key areas for development of smart cities in India with the case study of Chandigarh.

Md. Fuzail Jawaid, Saad A Khan (2015) in the paper has analysed that the cities are expanding due to rapid urbanization but these cities lack basic infrastructure services. Some Green field development has been started in certain cities but the result is not satisfactory to cater to the demands of sustainable cities, hence there is a need to plan for green field sustainable urban development in form of smart city to bring out a balanced urban development.

3. PURPOSE OF THE STUDY-RESEARCH

Objectives of the study:

1. To study the concept of smart city and the key areas for the development of Udaipur a smart city.
2. To explore the challenges faced by Government and the Resident of Udaipur.
3. To suggest solutions in making Udaipur a smart city.

4. RESEARCH METHODOLOGY

This current study has been exploratory in nature where pertinent information has been gathered from secondary sources such as Government of India and Rajasthan websites, documents of various ministries, departments and organizations, articles, reports, newspapers and relevant books etc.

5. BACKGROUND OF SMART CITY UDAIPUR, SELECTION AND CHALLENGES



Udaipur is located between 24°28'49" and 24°42'56" N latitudes and 73°36'51" and 73°49'46" E longitude. The city covers an area of 37 km² and lies at an altitude of 598.00 m above sea level. It is located in the southern region of Rajasthan, near the Gujarat border. Udaipur City is also known as the City of Lakes, the Venice of the East, or the Kashmir of Rajasthan.

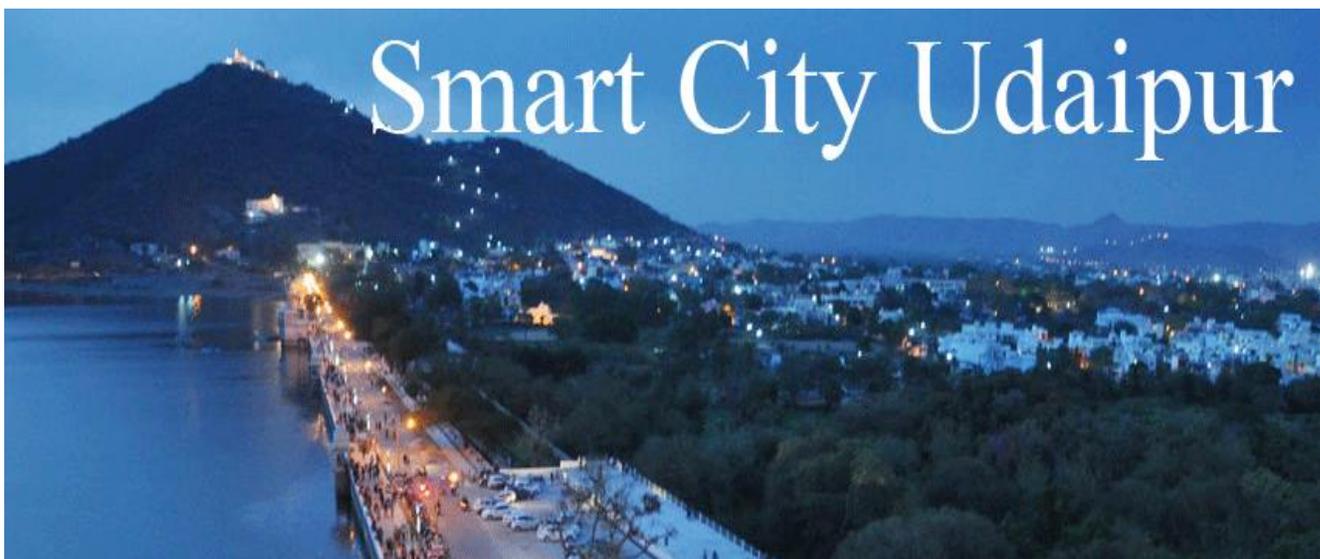


Fig.-2: Typical View of Smart City Udaipur



Fig.-3: Typical View of City Palace of Udaipur

It is the historic capital of the kingdom of Mewar in the former Rajputana Agency. Udaipur was founded in 1553 by Maharna Uda Singh II as the final capital of the erstwhile Mewar Kingdom, located to the south of Nagada on the banks of Banas River. Udaipur is well connected with nearby cities and States by means of road, rail and air transportation facilities, including Maharana Pratap Airport. Udaipur is a very popular tourist destination and known for its history, culture, scenic locations and the Rajput-era palaces and five of the major lakes are namely Fateh Sagar Lake, Pichola Lake, Swaroop Sagar Lake, Rangasagar and Doodh Talai Lake have been included under the restoration project of the National Lake Conservation Plan of the Government of India. Udaipur has a diverse source of economy, with major contributions from tourism, minerals, natural stones and handicraft. Udaipur hosts several state and regional public offices, including offices of Director of Mines and Geology, Commissioner of Tribal Area Development, Agriculture University, Indian Institute of Management, Centre of Excellence for Tourism Training, Commissioner of Excise, Hindustan Zinc Limited and Rajasthan State Mines and Mineral Corporation Limited. Udaipur is raising as Educational Hub as well, with 5 Universities, 14 Colleges and more than 160 High Schools.

5.1 Stage 1: Short Listing of Cities by the States:

The Stage 1 of the competition was intra-state, in which cities in the State and UT competed on the conditions precedent and scoring criteria set by Ministry of Urban Development, Government of India. These conditions precedent had to be met by the potential cities to succeed in the Stage 1 and highest scoring potential smart cities were shortlisted and recommended by State and Union Territory. On 27th August 2015, Ministry of Urban Development announced list of nominated cities for smart city challenge Round II. Four cities from Rajasthan have been nominated i.e. Udaipur, Jaipur, Kota and Ajmer.

5.2 Stage 2: The Challenge Round for Selection:

The 100 smart cities will prepare their proposals for participation in the city challenge. The proposals will be prepared by the empanelled consultant shortlisted through the RFP process. The smart city Proposal will comprise of area based model chosen, whether retrofitting or redevelopment or Greenfield development or a mix there of and additionally include a Pan-City dimension with smart solutions. It will also outline the consultations held with the city residents and other stakeholders, how the aspirations are matched with the vision contained in the Smart city proposal and importantly, what is the proposal for Financing of the smart city plan including the revenue model to attract private participation. It will be evaluated by a Committee involving a panel of National and International Experts, Organizations and Institutions. The Winners of the First round of Challenge will be announced by Ministry of Urban Development. Memorandum of understanding with Danish Water Forum was made to promote a mutually beneficial partnership in the field of environmental sustainability in the water sector.

Denmark has used to treat waste water, water bodies, solid waste and improvement quality of life for the citizens in the past 30 years.

5.3 Challenges Faced by Citizens of Udaipur:

The various challenges faced by citizens of Udaipur were infrastructure issues, Low literacy rate , Tribal Area , Deforestation, Hilly area, Rich Mineral, Water problems, Increase in Crime rate, Poverty, Decline in Greenery and Cleanliness, Sanitation Problems, Job quality, Quality of Hospitals, Rise in Pollution etc. Apart from Infrastructure Challenges, Bureaucratic and Procedural hurdles and Lack of funds and Investors are other challenges which the city is facing.

5.4 Lack of Water Resources:

A lack of Rainfall and Encroachment of Catchment Area of all lakes and Ground Water Supply the Water distribution system by Public Health Engineering Department has become insufficient as a result of increase population and Municipal Area over a period of last year. Idol Immersion in the lakes during festive has been completely stopped by Citizens.

5.5 Lack of Proper Sewerage System:

Udaipur does not have a planned and full-fledged sewerage system. A large area of the city has no proper sewage network, and the raw sewage or septic tank outflows are discharged into open drains which flow into the watercourses. Ultimately most of the sewage flows into the catchment area of lakes and into the Nallahs. Urban Development Trust has been started the work at Gumaniyan Nallah 2 KM length under Pilot Project and Ayad River Development. Solid Waste is properly collect from door to door done by Agency.

5.6 Problem of Pollution:

In Udaipur it was seen that at places where traffic density was high the air quality of those places revealed high rate of pollution level also. In recent years it has been seen that Udaipur city has been expanding and lot of development activities such as increases nos. of Universities, Fertility Centre, IIM Institutes, Centre of Excellence for Tourism Training by help of Singapore, which there has been discharge of waste water in the catchment area of lakes of the city, which again is causing serious threat to water bodies. For future only CNG Kit Vehicles have allowed and all water bodies to be made free from waste water through proper design of sewage system. Water harvesting system is to be monitored by local authority for newly Constructed Government Building as well as Private Building. Efforts will also be made to generate energy and create compost from waste, reduce the amount of waste generated by the construction, restoration and destruction of buildings and manage water resources more effectively.

5.7 Problem of Transportation:

Due to lack of metro structure, Bus and tempo and taxi is the only means of transportation for the residents of the city, as a result of which the people are left with no choice except to use their own private vehicles, also due to increasing population more of vehicles has been seen in the cities due to which there has been traffic congestion in the city. A user-friendly bus route information system eludes the city. For many destinations, two buses have to be changed, but there are no route plans to guide commuters. The bus numbers are mentioned at every place, but not the route and the time it will take to reach its destination.

5.8 Problem of Security and Safety:

Due to lack of industrialization and laxity on the part of Government to create jobs many educated and qualified professionals are unemployed. Due to this, present day youth is forced to commit suicide or get involved in some nefarious activities such as kidnapping, robbery, chain snatching which in turn creates havoc in the life of normal citizen and it is dangerous for the people to survive with peace in the city. The Government Land Encroachment at Badgaon has removed by Local Authority.

5.9 Poor Parking Management:

Parking is a serious issue in the city of Udaipur and its Management needs topmost priority. Parking demand is very high in the Commercial Areas. Due to absence of adequate off street parking facilities, parkers are forced to park their vehicles on the

streets which in turn reduces the effectiveness of road. In Udaipur the inner city area has been facing problem of narrow streets and such streets has been encroached by parking area.

5.10 Challenges Faced by the Government of Udaipur:

The Udaipur local Government while designing the plan for Smart City initially selected the posh localities area which is densely covered Green belts. A large number of local residents and Retired Bureaucrats were unwilling to handover it to Udaipur Municipal Corporation because the area was already developed by Mohan Lal Sukhadiya Former Chief Minister of Rajasthan, it's in the vicinity of Government offices, Secretariat and Main Commercial Market and also it has one of the most dense plantations in the capital. The appeal from the opposition was to allocate underdeveloped area for the project of Smart City. Another challenge faced by Rajasthan Government is lack of funds. Money acts as a constraint since Central Government has allocated limited amount of funds for the Project and due to scarcity of funds, money is withdrawn from various Yojanas of the Rajasthan Government. A greater number of Government services will be offered online i.e. e-governance, especially on mobile phones, making public services more affordable and enhancing accountability and transparency. Citizens will be active participants in Government and would be able to provide feedback on e-groups.

6. PROPOSALS

Udaipur Municipal Corporation has come up with supervisory control and data acquisition technology that will provide alerts on water outage. It is designed specifically for Municipal application such as water, waste water and sewage. It uses ultrasonic, electromagnetic and pressure gadgets to gauge flow, contamination, leaks and illegal tapping. Data can be stored for 5 years. It will be integrated with smart city app Udaipur Plus. Udaipur Municipal Corporation is set to initiate Pan-city proposals that will be the stepping stone to make Udaipur a smart city. Fast-track projects focusing Pan City development would be initiated first by Udaipur Smart City Development Corporation Limited.

6.1 Suggested Solutions in Making Udaipur a Smart City:

Intelligent Government service has emerged as the key feature in making Udaipur a smart city followed by Information Technology connectivity. Through intelligent Government services, the citizens of Udaipur want easy interaction between Government and Citizens through online service and from Information Technology connectivity, the Citizens expect robust internet network with high speed connectivity to all offices and houses. Citizens want 24 hours clean potable water supply, more job opportunities, good transport facility, involvement of citizens in making plans for city and education facility, 24 hour electricity to make Udaipur a smart city. As a way forward, Udaipur should transform itself into a tourist destination that will lead to increase in job opportunities in tourism sector.

6.2 Proper Drainage System:

The most important need is to have a proper underground drainage system. The drainage should be cleaned at regular intervals. Solid waste management is good but need to be done before peak hours. Solid waste should be separated and used as manure. The liquids out of that waste should be used for watering road side plants and grass. Good waste management is built on three pillars-Reduce, Reuse and Recycle. Together they contribute to create a healthy environment for everyone.

6.3 Roads:

The roads should be double lane 3 tier systems have to be there –

1. The side of the Main roads should be properly tiled. Grass should be properly maintained.
2. Dividers must be properly illuminated by phosphorescent light paint.
3. Beyond grass, there has to be lane for bicycle. Proper road signs must be there which must be illuminated at night.
4. Zebra crossings must be properly made. Parking of vehicles must be at designated places only.
5. The road lights must be illuminated by Light Emitting Diode to minimize the Electric Billing.
6. All these roads must be under the camera surveillance. Shifting of Solar Energy on top roof of building
7. For future multi- stored, under- ground parking to be introduced by local authority for optimum utilization of land.

6.4 Parks and Public Places:

These should be properly maintained by using following steps:

1. Dust bins should be placed at regular intervals.
2. The benches which are there in parks and public places should be cleaned at regular intervals.
3. More and more trees and flowers should be planted near such places.
4. These places should be under security camera surveillance.
5. Wash rooms / Ijjat Ghar should be there near such places.
6. Canteens need to be set up along with it some souvenir shops should also be established where people could buy souvenir depicting Udaipur.
7. The public places in Udaipur which needs re-development like Heritage Building i.e. City Palace, Jag Mender, Jagdish Temple, Pratap Gaurav Kendra and Sajjan Garh Palace etc.

6.5 Markets:

Markets should be free from encroachments of shopkeepers. Pavements should be wide and illuminated. Parking should be at designated spot only. There is a high need for a washroom to be there in every market with all amenities. The markets should be under surveillance of camera. There has to be armed guards with tight vigilance.

6.6 Washrooms / Ijjat Ghar:

Every 2 km and where requirement must have a Washroom. Washroom should have a beautifully glazed tiles and automatic sensors for cleaning. Attendees have to be there for 24 hours. Nominal rates could be charged for using the toilets. Dustbins have to be placed at regular intervals. The waste should be concealed and cleaned on regular basis. Hand wash sanitizers and paper napkins should be provided.

6.7 Intelligent Transport Systems:

Intelligent Transport Systems integrates the whole array of multimodal transport options in a city, including both individual mobility and mass transit options, in an efficient manner. Modern Intelligent Transport Systems normally comprises of many subject i.e. network of sensors, connected cars, GPS tracked public transportation, dynamic traffic lights, passenger information panels, automatic number plate readers, CCTV systems, navigation facilities, signaling systems and most importantly the capability to integrate live data from most of these sources. This can lead to major improvements in safety, network management, traffic congestions, environmental performance, accessibility, convenience and public perception. Citizens will be able to walk or cycle to places where key administrative services are provided. Provision of electric vehicle charging points have also made. This encourages their uptake, especially if electric scooters and other small vehicles are facilitated for what are, after all, the majority of journeys: short ones. In order to be a smart city problem of traffic needs to be addressed and following steps need to be taken like-

1. There has to be policing on all major squares.
2. Police should be properly armed and should be given motorcycles and placed on each busy squares to grab a traffic violator.
3. Working sensitive night vision cameras should be installed on all the squares.
4. No traffic horns should be used except for emergency, police and ambulances.
5. Over-speeding should be a grave violation.
6. Pressure horns used in school, college buses and trucks must be mostly banned.

6.8 Smart Healthcare:

The provisions of healthcare are being used intelligent and networked technologies which help monitor the health conditions of citizens. It is enabling a shift in focus to prevention instead of cure with a broader view of overall care, healthy living and

wellness management. It is applicable for both in/out patient environments ensuring the availability of appropriate health care and resources at the right time. Smart healthcare systems are being used in both developed and developing nations.

6.9 Civic Rules:

Under the civic rules, following steps has been suggested-

1. Littering must be heavily fined say up to Rs 500.
2. Spitting or smoking in public places should be banned.

6.10 Free WI-FI City:

Another step would be to make Udaipur as a free wi-fi city and to declare Udaipur as Plastic free, Noise free, Hoarding free city and also to declare Udaipur as Green city of lakes and mountains.

6.11 Smart Solar Rooftop Power Plant:

Udaipur City would be to make as a Solar Mission city. To make primarily for captive consumption and secondly for surplus solar power to be fed to the Grid. The Government of India has been taken a 30% subsidy for General category States and 70% subsidy for Special category States.

7. CONCLUSIONS

The smart city is a concept which is deemed to be the solution for the present day problems as well as the sustainable future. The development of rural areas, people are migrating towards Udaipur in search of jobs, livelihoods, education and other facilities as a result its size more and to much houses are built on agricultural land. Need of the hour is to transform Udaipur city into smart city to avoid problem of unemployment, pollution, transportation etc. Smart cities can lead to sustainable development of the society. Government and People participation is required to make a Smart city. This captures the Spirit of competitive and Cooperative Federalism. States and Urban Local Bodies will play a key supportive role in the development of smart cities. Smart leadership and vision at this level and ability to act decisively will be important factors determining the success of the Mission. Understanding the concepts of retrofitting, redevelopment and Green Field development by the Policy Makers, implementers and other stakeholders at different levels will require capacity assistance. Major investments in time and resources will have to be made during the planning phase prior to participation in the challenge. The Smart Cities Mission requires smart people who actively participate in Governance and Reforms. Citizen involvement is much more than a ceremonial participation in Governance. Smart People involve themselves in the definition of the Smart city, decisions on deploying smart solutions, implementing reforms, doing more with less and oversight during implementing and designing post-project structures in order to make the Udaipur as smart city developments sustainable.

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