Smart City

Dr M V Chilukuri
Senior Member IEEE-PES/IAS/PELS
Associate Professor, Power Systems and Smart Grid
VIT University, 632014, Tamil Nadu, India
mahendra.chilukuri@vit.ac.in

The Indian Government is planning to develop around 100 smart cities in the next couple of years and in the first phase 20 cities were selected through '**Smart City Challenge**'. In the second phase another 13 cities were selected for metamorphosis as future Smart Cities. The Government is going to fund an average Rs 2350 Crore for each "Smart City" as a part of their development program.
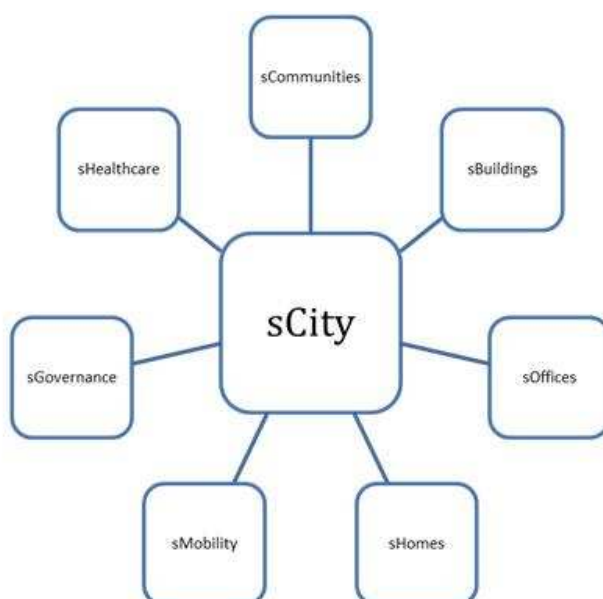
It should be noted that the idea to develop '**Smart Cities'** is indeed visionary and Prime Minister Shri Narendra Modi should be given full credit for taking the initiative in this regard to provide better quality of life to the public as well as to improve the infrastructural condition of cities which have been dormant for decades. It is heartening to see that the Prime Minister is taking the right step in this direction through '**Swachh Bharath**' campaign. In fact, there can be no quality of life if the cities are not clean and highly polluted. Furthermore, poor planning can lead to a complete breakdown of infrastructure and hamper disaster prevention and rescue operations during catastrophes like floods and earthquakes.
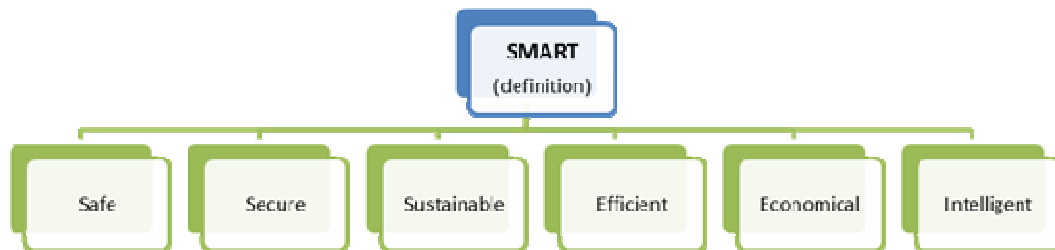
The Indian economy has undergone great changes in the last decade with increasing salary levels, movement of people to cities from rural areas, usage of smart phones, purchase of cars etc. However, the infrastructure like roads, highways, electricity, transport etc. remain the same in major cities and do not keep pace with the development and increased population.

It doesn't augur well for a country with 5 lakh engineers graduating every year. It shows a lack of will and vision to upgrade the infrastructure to meet the demands of the 21st century. In addition, if Rs 2350 crore is sufficient to make an Indian City 'SMART' then many state governments need not wait for funds from the Central Government but spend their own money. It is a clarion call from the Indian Prime Minister to state governments to focus on infrastructural development and plug in to a digital economy sooner to create next generation jobs in eGovernance, Healthcare, Clean Cities, Green Buildings and Smart Transportation using latest technologies.

What is a Smart City – sCity?

Currently, there is no simple or clear definition of a smart city and this lack of definition leads to confusion and failure. A Smart City is conglomeration of Smart Communities and Smart Community is a collection of Smart Buildings, Smart Offices & Smart Homes. The word 'Smart' in all these elements has five characteristics (a) Sustainability (b) Safety (c) Security (d) Efficiency (e) Economical (f) Intelligent with an objective to improving the environment and reducing carbon emission thus providing a clean environment and a better quality life to public.

SMART
(definition)

Safe | Secure | Sustainable | Efficient | Economical | Intelligent

Smart Offices/Homes should have Smart Appliances. In addition, all of these should have Smart Meters for Energy Monitoring and Conservation which is called a Smart Grid. Basically, a Smart Grid is an Intelligent Grid which provides Reliable and Quality Electricity Supply with Safety and Security in a Sustainable manner. **Thus 'Smart Grid' is the key to the development of 'Smart City' in terms of Energy Safety and Security as it connects smart communities, smart buildings, smart offices and smart homes in other words all entities of a city**. It is essential that a Smart City should have the following core infrastructure elements for a better quality of life and sustainable environment:

- **Electricity Supply**: $24 \times 7 \times 365$ days reliable and quality electricity supply. Reducing SAIDI and SAIFI on Electricity Distribution through Power Quality Monitoring System.

- **Water**: Continuos Water Supply, Water Conservation, Rainwater Harvesting, Quality Drinking Water, Appropriate infrastructure for storing and managing water during floods and droughts.

- **Safety & Security**: Safety and Security systems at all public & private places including safety personnel. Safety at Industries and Factories should be of highest standards.

- **Transportation** (Rail, Road, Ports and Air Infrastructure): Traffic Lights with CCTV at all junctions, Proper main roads (3/4 lane) with markers. Road over/under bridge. Clean Railway Stations and Airports with CCTV monitoring.

- **Online Govt. Services**: All government services should be available online to avoid traffic congestion and made a paperless, transparent, corruption free service.

- **Disaster Prevention & Rescue**: Resources for disaster prevention and rescue

- **Traffic Control**: Complete traffic control on all main roads with CCTV & Police on 24×7

- **Clean & Green Solutions**: Waste collection and disposal from all residences/buildings

- **Health Services:** High quality health care services for public at hospitals with no scope for cheating and looting.

- **Green Buildings:** Enforcing energy audit and conservation for buildings with 1 MW load. Sustainable design and construction of residential and commercial buildings with safety and security.

- **Policy, Law and Order:** Strong law enforcement through policy and framework

- **Education & Awareness:** Citizens must be educated and trained to follow rules and regulations at public places through awareness programs. There is a need to educate the educated to abide the law.

The objective of the concept of a Smart City is to provide clean, sustainable and safe environment with intelligence to improve efficiency and economy. This in turn will contribute towards the development of nation with reduced carbon emissions. India has the potential and resources to develop smart cities like Malaysia and Singapore. However, we fall short in maintaining discipline and need to enforce strong laws like Singapore. Some of the steps that city administration needs to take before thinking of smart city is to implement 'Swatch Bharat' and make the cities clean and enforce traffic rules. It will certainly enhance the image as well as act as a catalyst for sustainable development of cities and providing quality of life.

Smart City Roadmap

It is important to note that using LEDs for street lighting is a preliminary step in energy conservation but developing "Energy Efficiency Act" for buildings, institutions and industry which consumes more than 1MW is mandatory step and Govt should enforce 'Energy Efficiency' a must for smart city. Energy Consumption in Buildings, Transportation and Industry needs to monitored to improve the efficiency through innovative solutions. Water Supply, Sanitation and Waste Management is compulsory for all Smart Cities through innovative solutions. eGovernance is the key to develop Smart Cities as many services can be provided through online and internet kiosks to improve customer service and avoid corruption.

SMART CITIES SCORE CARD – 6 STAR RATING

Project Areas	Sustainable	Efficient	Economical	Secure	Intelligent	Safe
Energy						
Water						
Transportation						
Safety						
Security						
Governance						
Health						
Disaster						
Waste						
eCommerce						
Public Policy						
Tourism						
Education						
Engagement						

The skills most in demand from the 2017 top companies

TECHNOLOGY

Web Programming
Java Development
Cloud & Distributed Computing

FINANCIAL SERVICES & INSURANCE

Software Engineering Management
Web Programming
Java Development

HEALTHCARE & PHARMACEUTICAL

Healthcare Management
Project Management
Sales

RETAIL & CONSUMER PRODUCTS

Social Media Marketing
Web Programming
Software Engineering Management

MANUFACTURING & INDUSTRIAL

Project Management
Business Development & Relationship Manager
Engineering

GOVERNMENT, EDUCATION & NON-PROFIT

Process & Project Management
Web Programming
Java Development

MEDIA & ENTERTAINMENT

Web Programming
Software Engineering Management
Java Development

OIL & ENERGY

Project Management
Software Engineering Management
Engineering

PROFESSIONAL SERVICES

Social Media Marketing
Web Programming
Statistical Analysis & Data Mining

TELECOMMUNICATIONS

Project Management
IT Infrastructure & System Management
C/C++

AUTOMOTIVE & TRANSPORTATION

C/C++
Software Engineering Management
Java Development

Methodology:
Data based on recruiter inmails sent April 2015 to April 2017 targeting prospective hires across all functions for the 50 LinkedIn Top Companies in the U.S.