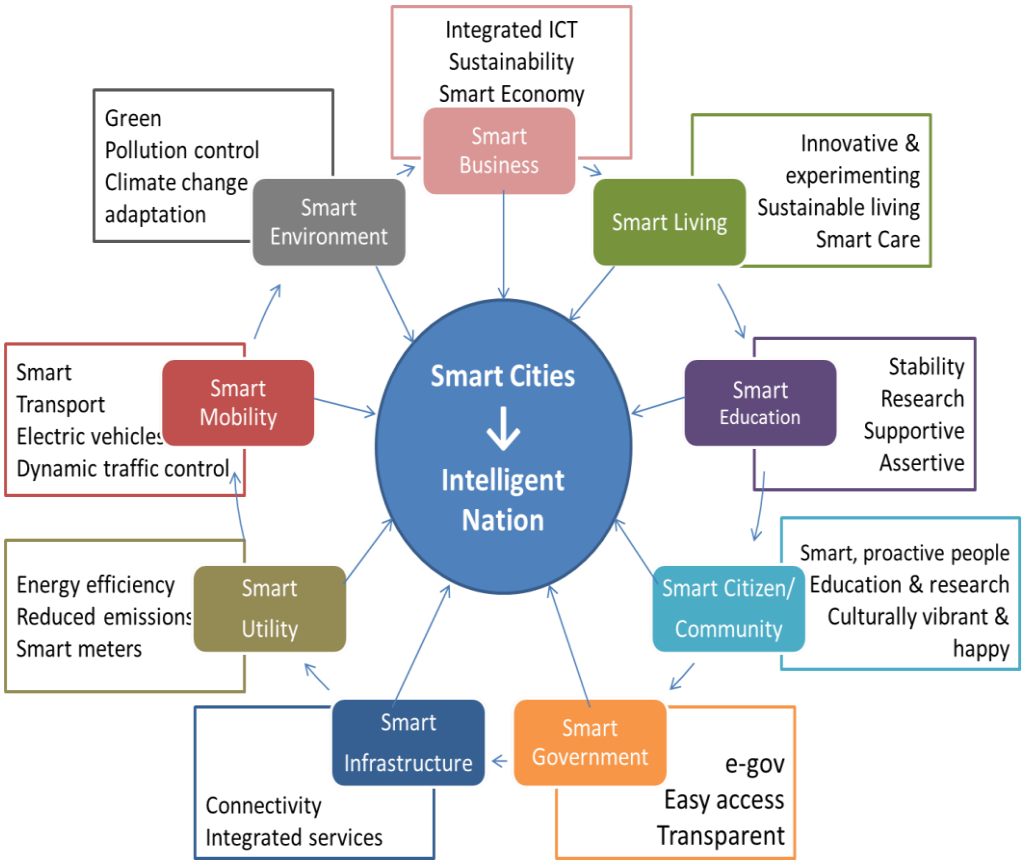
Smart City

The urbanization process has greatly improved people's standard of living, providing water supplies and sewerage systems, residential and office buildings, education and health services and convenient transportation. The concentration of educated people in cities helps to improve the industrial structure and promote production efficiency. However, urbanization also creates new challenges and problems. As a representative developing country, the economic advantages of Indian cities are being offset by the perennial urban curses of overcrowding, air and water pollution, environmental degradation, contagious diseases and crime; the urban issues of reducing air pollution and providing clean water, safe neighborhoods and efficient infrastructure desperately need to be addressed.

All these challenges and problems force citizens, governments and stakeholders to pay attention to the environment and sustainable development of cities, and to try to find a set of technical solutions to reduce these urban problems. The Information and Communication Technology (ICT) revolution has offered people the opportunity to reduce the scale of and/or solve urbanization issues. During the past 10 years, city systems have become more digital and information-based, and there has been a fundamental change in the living environment of citizens and the governing mode of cities. The economy, culture, transport, entertainment and all other aspects of cities have become closely combined with ICT, and the Internet has become a major part of citizens' daily lives. The abundant accomplishments of digitizing a city's information not only introduce daily convenience to the population, but also establish an infrastructure and conglomeration of data as a basis for further evolution of modern cities. Over the last 10 years, innovative information technologies such as cloud computing, 'big data', data vitalization, the 'Internet of Things' and mobile computing have become widely adopted in a variety of different areas. Cloud computing enables, developers to provide internet services without the need for a large capital outlay on hardware for deployment or the staff to operate it. The amount of information published and processed both on- and offline has given rise to an information explosion, and a new field dedicated to dealing with it—big data— which has spawned the need for new, more scalable, techniques to derive answers from huge sets of data. The emergence of the Internet of Things makes it possible to access remote sensor data and to control the physical world from a distance, meaning that cities can effectively sense and manage essential elements such as the water supply, building operations, and road and transport networks. Data vitalization proposes a new paradigm for large-scale dataset analysis and offers ubiquitous data support for top-level applications for smart cities. With the help of mobile computing, users can access and process information anywhere, and anytime, on all aspects of life. The urbanization, growth and associated problems of modern cities, coupled with the rapid development of new ICT, has enabled us to first envisage the 'smart cities' concept, and now to begin to build smart cities, which is seen as the future form for cities. Figure 1 shows how a smart city is formed. Smart city includes smart business, smart living, smart education, smart community, smart government, smart infrastructure, smart utility, smart mobility and smart environment.



The new Internet of Things (IoT) applications are enabling Smart City initiatives worldwide. It provides the ability to remotely monitor, manage and control devices, and to create new insights and actionable information from massive streams of real-time data. The main features of a smart city include a high degree of information technology integration and a comprehensive application of information resources. The essential components of urban development for a smart city should include smart technology, smart industry, smart services, smart management and smart life. The Internet of Things is about installing sensors (RFID, IR, GPS, laser scanners, etc.) for everything, and connecting them to the internet through specific protocols for information exchange and communications, in order to achieve intelligent recognition, location, tracking, monitoring and management. With the technical support from IoT, smart city need to have three features of being instrumented, interconnected and intelligent. Only then a Smart City can be formed by integrating all these intelligent features at its advanced stage of IOT development. The explosive growth of Smart City and Internet of Things applications creates many scientific and engineering challenges that call for ingenious research efforts from both academia and industry, especially for the development of efficient, scalable, and reliable Smart City based on IoT. New protocols, architectures, and services are in dire needs to respond for these challenges. The goal of the special issue is to bring together scholars, professors, researchers, engineers and administrators resorting to the state-of-the-art technologies and ideas to significantly improve the field of Smart City based on IoT.

So, when we talked about smart cities; what is it. So, in addition to the regular infrastructure that is there in any city for example, the urban infrastructure consisting of office buildings residential areas hospitals schools transportation police and so on you also need something in addition to make the cities smart. So, what is this in addition let us talk about. So, smart means what smart means that it is in terms of the services that are given to the respective stake holders of these cities. So, citizens are able to do things in a better manner in an improved manner then usual and how is that made possible that is made possible with the help of nothing, but the ICT technologies information and communication technologies which also includes electronics embedded electronics different other advanced topologies in electrical in a electrical sciences and so on. So, computers electronics put together can make these cities smart.So, definitely will have to take help of sensors ,sensor networks sensor networks then actuators then the different other communication technologies RFID, NFC, ZWAVE and so and so forth.

Modern urban spaces are hotbeds of new ideas and world-shaking innovations. As for urban adoption of connected tech: all things considered, it really makes practical sense. Densely populated areas stand to gain the most from improved surroundings, and depending on the city, they might already come equipped with the fundamental IT infrastructures, which makes the further adaption easier. Meanwhile, the IoT might also offer some solutions to ease the huge burden that the urban explosion has meant for the existing infrastructures.

Connected City

A common definition for a smart city is using ICT to make a city (administration, education, transportation, etc.) more intelligent and efficient. The definitions and concepts of smart cities are still emerging, and there is currently no clear and consistent definition of a smart city among the different stakeholders. In order to implement and assess smart cities in practice, a deeper understanding of the 'smart city' still needs to be defined. Many countries and cities have launched their own smart city projects to resolve urbanization issues and challenges. The USA was one of the first countries to launch a smart city project with a high compliment of smarter planet notions from President Barack Obama. In particular, for developing countries, the speed of urbanization is considerably faster and, as a consequence, the infrastructure problems faced are much greater. In 2014, India declared an intention to build more than 100 smart cities, with high-technology communication capabilities, throughout the country. ICT plays an important role in smart city construction. Top-level architecture research plays a considerable role in guiding technology development in every domain of a smart city and improving research into resource configuration. Now let's extrapolate the potential use cases to an entire city in which we have many objects that are capable of capturing information and interacting with other objects. The street lamp can now not only communicate with the devices that are closest but with other objects that are connected to the Internet and process this information to make decisions, for example, about the intensity of the light that is the most appropriate. The objects can also send information about what is happening in their environment or process different information. If the information from the street lamp is processed alongside with information from a nearby traffic light, we can start talking about the IoT use cases in the smart city environment.

When it comes to smart cities and the management of public space, the scope of possibilities, that IoT offers, is infinite. In other words, the IoT comes with considerable possibilities and room for manoeuvre within the field of smart cities. It is one of the aspects that we will touch in the Master's in Global Smart City Manager. IoT is a technology that is already there, that has been developed for a long time, but whose implantation in the public space will prevail in the years to come.

And depending on the way we approach our smart city project or the implementation of this technology in public space, smart city projects will be developed in one way, or another, they will be able to achieve common objectives in one way or another.

Possible IoT Use Cases for Smart Cities

- **Smart parking**

An IoT solution will permit monitoring the availability of parking spots in the city. With the GPS data from drivers' smartphones (or road-surface sensors in the ground), smart parking solutions let the user know when the closest parking spot becomes free to find a parking spot faster and easier instead of blindly driving around.

- **Smart roads and smart traffic congestion management**

Different IoT solutions will permit to monitor vehicle and pedestrian levels to optimize driving and walking routes. The use of different types of sensors, as well as GPS data from drivers' smartphones will help to determine the number, location and the speed of vehicles. Thanks to a cloud management platform which connects various traffic lights, the city will be able to monitor green light timings and automatically alter the lights based on the current traffic situation to prevent congestion. Better control of traffic congestion will also help to improve air quality**.**

- **Smart public transport**

With the help of IoT sensors, we can obtain data to learn about the patterns of how citizens use public transport. Smart public transport solutions can combine multiple sources, such as ticket sales and traffic information. The users could also use an app to contact the authorities in case they spot incidents or suspicious activities.

- **Smart street lighting**

IoT-based smart cities allow better maintenance and control of street lamps. Equipping streetlights with sensors and connecting them to a cloud management solution makes them more straightforward and cost- effective. With this system, the city can adapt the lighting schedule to the lighting zone and weather conditions.

- **Smart waste management**

Waste-collecting is another service that could be optimized with an IoT-enabled solution by tracking waste levels, as well as providing route optimization and operational analytics.

Advantages of a Smart City

Smart cities can be described as cities capable of using information technology to create efficiencies and create sustainability, and improve the quality of life of it's residents. A smart city is basically a living entity, capable of extraordinary adaptations that we once thought were not possible. This post will be discussing smart cities, including what makes a smart city, it's benefits, it's effects on the environment, and what negative effects, if any it might have on it's citizens and the world as a whole.

The benefits of smart cities

- **Efficient distribution of resources**

Smart cities have an overall better organization and infrastructure. All the sectors are involved in a complex interplay that simplifies everyday life for people who live and work in the city. The cameras at the bus stops can identify how many people are waiting to board; the sensors on the approaching bus know how many people ride the bus at any given point in time, and how many people are currently on the bus. The combination of the information from the bus stop and the bus then leads to the city's response. There can then be redistribution of people and buses if it appears that the current course of events will not be efficient.

- **Seamless communication**

Communications between the various systems and sensors in a smart city is very important. In fact, without them the smart city cannot efficiently redistribute resources and make citizens' lives better. However, smart cities bring about a different, equally efficient communication–the communication between the citizens and the government of the particular city.

In prior times, policies and programs were made based on what the government perceived to be needed by the city. This often led to massive oversights and the omission of key policies altogether. In a smart city, the

policy makers have all they could ever need to make informed decisions. The information gathered all across the city provide an invaluable line of communication between the needs of the city, and the people who can address those needs.

- **Speed of implementation**

Still on governments and policies, every country with a democracy can testify to the fact that it takes quite a while for policies, or any sort of new development to get implemented. This is partly due to bureaucracy and the multiple levels of government, and also partly due to the human factor. Smart cities overcome these problems very easily. Because the points that need improvements have already been identified, the implementation becomes easier. All the automation, analytics, and sensors contribute to making it easier for most of the changes to be implemented remotely, creating a seamless flow of change from conception to execution.