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IOT Based Smart City - A Review

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ABSTRACT

IOT has emerged now as a completely different domain that has the capability of changing the life of the people through automation. Cities now a day has seeing remarkable growth, bringing major challenge for the people to achieve sustainable development that can fulfil the desire of the people. IOT offers new opportunities to the people for managing the traffic, pollution, health, education, manufacturing sector and make the best use of the current available infrastructure through automation to achieve the sustainable development as desired by the people.

Keywords : Internet of Things, Smart City, Gateways, TV

I. INTRODUCTION

Internet of Things (IOT) is a collection or network of several physical devices assigned with unique ip-address, embedded with electronic sensors, software and network connectivity that enables them to collect and transfer data.

IOT can be anything, a person, vehicle, building that is embedded with electronic sensor which has the capability of collecting the information and exchanging between them.

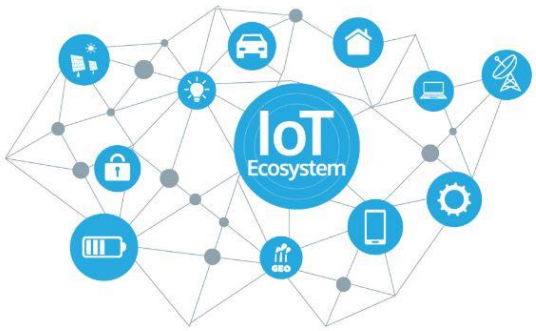

Figure 1

II. IMPLEMENTATION OF IOT IN CITIES:

1. Precision agriculture

Precision agriculture is a modern approach to farm management in which farming is done with the help of information technology. In PA, different sensors are used in the field as well as in the crops to ensure that the soil has enough moisture to feed the plant.

This technology will enhance the productivity as the plant and soil will receive exact required nutrition. The sensors in the field will measure the moisture content and several drones will capture the real time image of the crops which will ultimately help the farmers to get the real time information about the plant.

2. Smart home

IOT has greatly changed the life of the people by home automation. Everything can be made automated according to the need of the people. With the invention of Smart TV one can directly connect

their TV to the internet and play music and videos on demand. Even some of the smart TV has the feature of voice as well as gesture recognition.

Smart lighting helps to adjust the light according to the daylight. Using smart locks users can grant or deny access of the visitor. Using smart security camera user can monitor their home from any part of the world, all they need is just a mobile and internet connectivity. Kitchen appliances can also be made automated , smart coffee makers will brew fresh coffee for the user, similarly smart refrigerator will keep track of the foods.

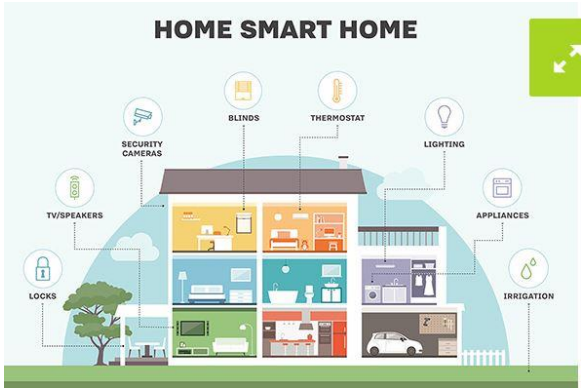

Figure 2

3. Health care

With the help of IOT, health care domain has achieved tremendous success in these days. Patients are examined before reaching to the emergency room saving the precious time of the doctors as well as patients.

Various health care devices have been introduced now a day's which will track user everyday routine and health status. It will collect the data regarding the user blood pressure; heart beat and transfers that crucial information to the concerned authorities which will help in examining the patient in better way even than before.

5. Smart Traffic

With the increase number of vehicle nowadays, it raises a serious concern about managing that traffic. According to the WHO, half of the world population lives in cities, and these population is increasing by 2% every year on an average.IOT helps in managing the traffic with the help of big data analytics. The sensors, cameras used in the smart city collect and transmit information to the central repository which helps in managing the traffic by finding the real time images of traffic as well as free parking space in the big cities. With the help of those information the proper utilization of traffic can be done.

Similarly on the other hand a lot of companies are developing driverless cars now a day. These cars are embedded with various sensors and software. The driver have to set a destination and automatically the software calculate the distance. Cameras places in the front and rear wheel will take care the sideways movement of other cars in the street. Artificial intelligence software in the car is connected to all the sensors and has input from the Google street view and video cameras inside the car. The car software uses Google maps for noticing the nearby landmarks and traffic signs.

6. Education

The use of IOT has revolutionized the education sectors. Now a day's people don't have to go to the college and university for the degree. The high definition camera placed in the classroom helps the student to watch the lecture from anywhere in the world with the help of internet connectivity. Even the real time discussion has been made possible with the professors by the use of IOT.

III. METHODS & DEVICES

Here we're going to describe about the devices that are required to implement IOT for smart cities.

1.Backend Servers

Backend servers are the backbone of IOT because for implementing IOT in cities we need to deal with huge amount of data. IOT is all about data and make the best use of it. So for this purpose we need a central repository system from where data can be easily fetched out whenever in need.

Technically, backend server are not necessary for a IOT device to operate but the data which IOT devices needs is stored in the backend server so with the help of these there is no use of the IOT device.
Lets, take an example of smart traffic system. At First we should know that how the smart traffic system works? In a smart city, several cameras are places in the different point on the roads to see the vehicle and pedestrians those visual are stored in the backend server in the cloud so that the traffic management system can use that video in real-time to help managing the traffic.

2. Gateways

Gateways in this case can be defined as the internet service provider that will connect the IOT device to the backend servers. Because IOT devices will need the data in order to function, so the gateways or ISP's will do this bridge gap. All the data, which is stored in the back end server, goes through the gateway, which can be either a dedicated hardware appliance or software program.

Some sensors generate tens of thousands of data points per second. A gateway provides a place to pre-process that data locally at the edge before sending it to the cloud. When the data is aggregated, summarized and tactically analysed at the edge, it minimizes the volume of data that needs to be forwarded on to the cloud, which can have a big impact on response times and network transmission costs.

Another benefit of an IOT gateway is that it can provide additional security for the IOT network and the data it transports. Because the gateway manages information moving in both directions, it can protect data moving to the cloud from leaks and IOT devices from being compromised by malicious outside attacks with feature such as encryption.

3. End nodes

End node is any devices in a network that is used to collect and send data in a network. In a simple words, end nodes can a sensor placed in your home for the automation, which will collect the data and finally communicate with the cloud. At the peripheral of IOT system, we find the devices in charge of producing the data to be delivered to the control center, which are usually called IOT peripherial nodes or simply IOT nodes. IOT nodes may be classified based on a wide number of characteristics such as powering mode, networking role, sensors/actuators equipment.

IV. CONCLUSION

In this paper, we have analysed how we can implement IOT in cities to make it as a smart city and experiencing the new era of automation. IOT has that potential if used in proper manner; it can change the fate of the mankind in positive way. The main aim of smart city is to support better living, create more opportunities, support stronger and more cohesive communities and improve the quality of life overall for all residents. It also ensures whether all the public resources are utilizing properly or not. IOT also reduce the operational cost of the public administration.

V. REFERENCES

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