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Introduction of Internet of Things and its Applications

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Abstract: *This evolutionary world is a technical world, where most of our devices are connected to each other. Moreover, these all devices are communicating even without the interference of human being. If we go back to the time of 18th century, then it was only the dream of such invention, in which devices do our task perfectly without interference of human beings. Some brilliant scientists invented these devices and make a network for all the devices. The network in which these devices communicate is called as Internet of Things (IoT). In this paper, we will discuss about from where IoT term start, brief knowledge of IoT and its applications.*

Key words: Internet of Things, Precision agriculture, Internet of Home Automation Things, Internet of Animal Things.

Introduction: As we can see the use of internet increasing day by day. In starting of internet, people only use the internet to find their curious question's answer and after that they were able to do chit chat and moving one step ahead they are able to do a video call communication and now, things are also connected to internet and able to communicate with each other. This communication makes our era flexible, in which we don't need to get up for switching on the light, we can get the position of our devices and animals and there are many things which make our life easier. These devices are known as IoT devices. The world of these devices has merged with the world of human beings and makes a connection with us as shown in figure 1. The internet of things, is a network, where devices have a connection among them, so that, they can communicate and send the information to one another.

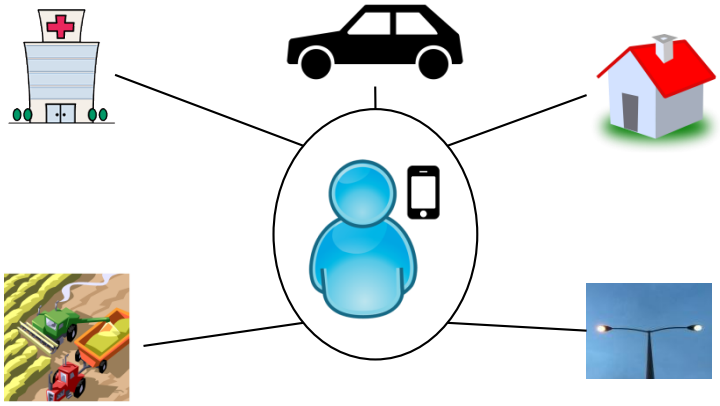

Figure 1 : Internet of Things

As we can see that devices of our modern houses have connection among themselves, our cars build on IoT, parking system have sensors, our watches are based on IoT. So, in this paper we will discuss about the different applications of IoT.

IoT that connects the things is a very complex structure and can perplex anyone if the structure is not divided into different parts or different layers. So, basically the architecture of IoT is divided into three layers; Perception layer or sensor layer that helps in sensing the environment and retrieving the data from the device, second layer is network layer or transmitting layer, that uses the different network terminologies like Wi-Fi, Bluetooth, Zig bee, Near field communication and many others. These helps in transferring the data from one node to another node, here nodes are IoT devices. Third layer is application layer or user layer, which helps in using and maintaining the IoT device.

I. Internet of Medical Things (IoMT)

In [3], author has discussed the RFID system in the medical organisation. Medical equipments/ things attached with RFID and all have unique identity for addressing the correct node. RFID in internet of medical things help in analysing the data, non-contact identification of required blood for the treatment of patients, help the patients to analyse their previous diseases, treatment and also helps in telling which disease

would occur in future. The main motive of IoT in medical organisation helps in making the people fit and give awareness about the fitness and diseases.

II. Internet of Agriculture Things (IoAT)

In [4], author has described the Precision Agriculture (PA), which is an efficient method for producing the food and less harmful for environment. In this author divided the large field into small field and maintain each field independently. In his paper, he used the crop stress ratio for irrigation management.

Internet of agriculture things architecture can be divided into three layers;

1. Lower layer: Lower layer helps in collecting the data from different agriculture things and this layer has different sensors for collecting the information.
2. Middle layer: Middle layer does the decision making process and filter the data for further processing.
3. Top layer: Top layer helps in maintaining different agriculture operation like irrigation, manuring, fertilisation, harvesting and many others.

III. Internet of Home Automation Things (IoHaT)

Home automation system, in which different devices of home are connected wirelessly to each other and there are some IoT devices which reduce the power consumption by enabling and disabling the device according to requirement.

In [5], author proposed a home automation system using a raspberry pi in which proposed algorithm read the subject of the mail and that algorithm is stored in raspberry pi. The algorithm works according to received mail.

Author proposed a central controller system, in which an interface between the device and server. Server helps in switching the case. It also has RF transceiver that connect to the central controller.

IV. Internet of Smart City Things (IoST)

Internet of smart things is integration of multiple smart things as shown in Figure [2]. IoST helps in improving the standard and ease of life, gives clearer environment.

Smart street light has the grid monitoring system that has sensors and provides the real time alert and real time control and it also has smart schedule. Smart parking system gives an efficient method for parking the vehicles, this can be done by using sensors in the vehicles and parking area.

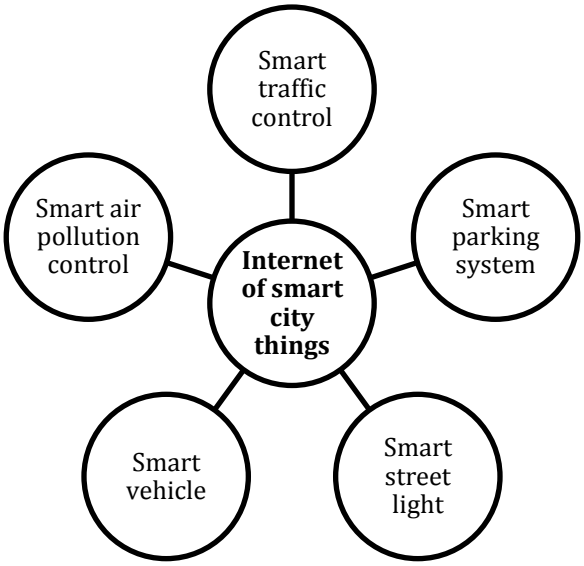

Figure 2: Internet of smart city things

V. Internet of Animal Things (IoAT)

In this modern technology world, sensors can be inserted into body of animals, that help in tracking the animals. Sensors can be inserted into the trough of animals which helps in decision making of cleaning and filling the trough. In future, there is a possibility that sensors inside the body of animal helps in reminding the some information.

VI. Internet of Clean environment Things (IoCeT)

In Internet of Clean environment Things, smart dustbins are available in which sensors can present at the mouth of dustbin which helps in decision making bio-degradable and non bio-degradable objects. Sensors near tree and road gives the real alert for cleanliness and make a healthy and clean environment.

Future scope

Everyday researchers are trying to make new IoT device and to make more efficient the existing devices. If we see the world of IoT, it makes our life more comfortable than before. At present, we are little bit depend on IoT devices but this dependency is increasing day by day. Although this dependency making our work easier by doing it in a smarter way but somewhere these devices are making us lazy, like we don't need to go for switching on the light, for opening the door and many other works that don't require

any human intervention. In future, we don't need to do anything, there will be so many devices and connection between them that we would be sitting and every work will doing independently.

Conclusion

At present, we are much depended on internet and internet of thing devices. There are many devices are present that help in our daily routine task but there are some gap that means there are some more devices can come up in future like animals will able to identify in which direction they able to find food for themselves, a device which sense the human body and identify what disease would occur and what measure should taken to control that disease and there are many others direction in which IoT world can grow more.

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