Recent Trends Applications and Challenges of the Internet of Things

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ABSTRACT:
The New beginning of computing technology is arriving such as the Internet of Things (IoT). It is a kind of Global Neural Network the cloud that interfaces various gadgets. Human life and the way we work has been revolutionized by the Internet in the past decade. Currently, IoT is changing the trends of human life as the use of emerging technologies which consist of heterogeneous communication devices is increasing. IoT will be a key aspect for the society that will be implemented to change the older trend of living and the way of work. IoT consists of smart machines that interact and communicate with other devices, environments, objects, radio frequencies, and sensors. On this planet, IoT makes lives safer and easier and it will also help to change the environment. Hence it is important to study the recent trends in the Internet of Things its applications, future, features, and challenges in the current scenario. This paper is all about the recent trends in Internet of Things, its applications, and challenges.
Keywords: IoT, Smart Device, Smart Home, Smart Vehicles, Smart Hospital.

1. INTRODUCTION

Kevin Ashton prepared the articulation "Internet of Things" in 1999. He made it in his workplace, Proctor and Gamble. Ashton composed putting a RFID pennant on each lipstick and having them talk with a radio recipient. It raised the way that this data collection can be used to deal with a lot of issues in actuality. Wireless communication devices have a new scenario called IoT. Everything that exists in the world or exists in the future, internet is the facility to manage them using IoT [1-3].

Internet of Things and its application have become an important part for today's human lifestyle. It has become an important tool in every field. You have heard the term "Internet of Things" (IoT) at many places such as in an article or in an advertisement or on social media. But the term IoT is broad and can cover huge amount of information. As the majority of the cycles are done through the internet, we need a functioning high-speed internet connection. All the hardware's that are used in our everyday life is a piece of IoT and can be controlled and observed utilizing IoT. Therefore, the Connection between human- computer things is explained by technology [4-8].

With the help of sensors in IoT the majority of processes can be done. Sensors can transmit raw physical data into digital signals to its control center that's why sensors are deployed everywhere [9-11]. In this paper we are discussing about the recent trends in Internet of Things, its application, future of IoT , and challenges in IoT in current scenario.

2. Applications of IoT in Different Fields

Internet of Things is used to connect various things which we use in our daily life.

Figure 1: Application of IoT [27]

IoT can assume a huge part on the whole territories of regular day to day existence, Figure 1 shows the potential zones. Such zones shift from schooling to wellbeing, shrewd homes to brilliant urban communities, transport to energy, and so forth.

2.1.Smart Cites

The IoT has the power to transform entire city into smart city by solving problem faced by citizens of that city every day. With the proper connection and data and providing high speed internet they can solve many problems of city by using IoT based devices. Smart parking, urban maps, smart lighting are some of the applications of smart city [12-13].
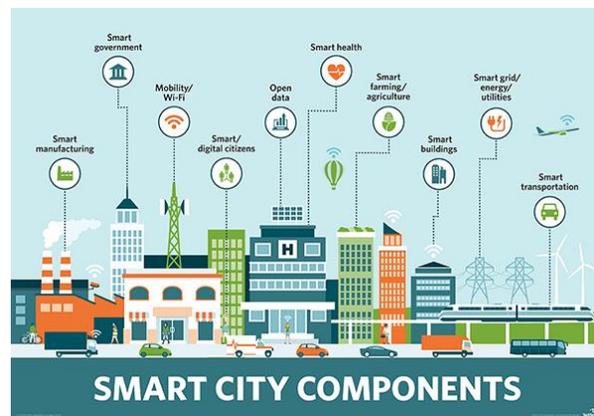

Figure 2: Smart city using IoT [25]

2.2.Smart Vehicles

The smart vehicles have internet access and can share that access with others just like connecting with a wireless network at homes and office.This is possible due to IoT. There are vehicles which has full internet access, all the functions are done by the Artificial Intelligence, we can control the car by sitting at home by remote or the car has its own mind to control the car. Example of smart vehicles is driverless cars which is part of IoT make it possible to make driverless cars. Cars which have their own mind how to drive and at which speed limit and they have also the parking skill i.e. smart parking. This is possible due to sensors and AI which is part of IoT [14-15].

2.3.Smart Home

These are the devices which helps us to make the home smart such as amazon eco, google duo by these devices we can control all the electronic devices which are at home from anywhere by the help of AI. We can say them to play music or turn on the washing machine etc. all the things that we have at home can control by this method. These devices are work on IoT [16-17].

2.4.Wearable Device and smart watches

In the continues development of the wireless communication the max of the device for the daily communication are going to the used in wearable devices [18-19]. The watches which wear at hand are no longer used to see the time it is now all the things that anyone can do on a smart phone can be done in the watch that we wear on wrist hand we can make calls, do messaging, do chatting etc. even we can have the record of our health with the help of sensors embedded wrist fit bands. By this fit band we can have the record of our body fitness such as how many steps we walk in a particular day, heartbeat rate, calories burn etc. This all is possible due to the IoT based sensors.

2.5.Smart hospitals

IoT is utilized for tracking the objects, character, detecting, and authentication of individuals in the medical clinics. To follow the individual or the item moving the way toward tracking is utilized. Tracking is likewise used to decrease clinical record support and forestall confusing. RFID, NFC, WSN, Wi-fi, Bluetooth, and so on are the current patterns where IoT components are utilized. IoT is utilized to improve the observing strategies for the capacity like temperature, heart rate, and glucose.

Figure 3: Smart Hospital using IoT [26]

2.6.IoT in Agriculture fields

For collecting the information from the climate and soil, an observing sensor of IoT is utilized in the farming field, it will help for building up the inventory and development of the harvest. The stock and need of agrarian items have not been controlled appropriately because of the slight contrast in the state of harvest and weather change, infection and bug harm, and so forth The IoT based checking framework is executed to conquer it, it will dissect the yield climate and likewise help to improve the efficiency of dynamic by examining harvest measurements [20].

3. Features of IoT

Connectivity, analysis, integration, AI, sensors, etc are some most important features of IoT. There are following features mentioned below:

- **Connectivity:** Connectivity is setting up a suitable connection between all the IoT components of the IoT stage which might be a worker or a cloud. At the point when we interface the IoT gadgets, they need high velocity informing between the gadgets and the cloud to empower dependable, secure and two-way communication.

- **Analysis:** We have to do an analysis of the collected data in real-time and use it to build effective business intelligence. We call our system a smart system if the data gathered from all of these things are insightful.

- **Integration:** IoT integration between different models to improve user experience.

- **Artificial Intelligence:** Through the use of data collected IoT makes smart decisions and enhances the life of a human. For example, the coffee

machine itself orders the coffee beans of your choice from the retailer if the beans get expired or empty [21-22].

- **Sensors:** Without sensors, there can be no efficient or real IoT environment. Sensors used in Internet of Things technologies detect, measure and report any change in the environment. IoT technology brings passive networks into active networks.

4. Challenges

Although the Internet of Things assumes a significant part in different parts of life, there are not many issues and difficulties that ought to be engaged. This examination paper manages the most widely recognized issues, for example, increment in number associated gadgets, heterogeneous climate, increment information stockpiling, protection and security [17]. Standardization, Architecture, Scalability and Security are a portion of the difficulties that are talked about as follows.

- **Standardization:** It is the backbone of developing the Internet of Things and one of the most important and major challenges in implementing the Internet of Things. Bodies such as ETSI, ITU, and IETF, IEEE, etc. are the most important that are included in the IoT framework development. Providing an open level and smooth activity is not standardization its activity is different. This challenge has to be considered in the future for integration into different types of IoT technologies.

- **Architecture:** To enable the integration of different technologies, the architecture of the Internet of Things has put an important role. Support for continuity of service is done by architecture. The most important and the main challenge for the Internet of

Things system is the use of the integrated structure for a separate application. Adaptability, transparency, and dependability taking all things together sorts of climate are the primary prerequisite for the design. It ought to be multi-area empowered, basic, and adaptable reconciliation just as robotization in the Internet of Things. Equipment, software, systems administration, and sensors are the various sorts of gatherings in IoT engineering [17].

- **Scalability:** The addition of devices and services for current performance is referred to as the scalability of the Internet of Things. It supports the number of devices with different restrictions. We need the framework and Architectural Engineering to apply the scalability. The addition of new device and objects to the Internet of Things is the main problem of scalability.

- **Security:** To deliver device and stuff security has placed in a large part of the Internet of Things. Nowadays, there are many types of attacks that our network, system get and these can access personal information and can be used in wrong things. With the help of current technologies of IoT, it is difficult to provide security [23-24].

5. Conclusion

In the existences of millions of people, the Internet of Things assumes a significant part everywhere on the world. It reduces human collaboration and orders and gives greatest mechanization in different fields of society. However, all things have its issue thus; IoT innovation has its own execution issues and difficulties that have covered in this paper. In the future these issues and challenges can be

taken and possible solutions that make up the Internet of Things can be suggested eventually reliable, stable and safe structure.

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