International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 06 | June 2020 www.irjet.net p-ISSN: 2395-0072

A Survey on Internet of Things Technologies, Applications and Sensors.

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ABSTRACT - *Internet of Things is the biggest achievement of recent era. At first it's known as "Internet of Everything's". With IoT, the physical object can be send and receive data to the enormous source. Without human to human or human to system interactions the information can be exchange through network interconnections. The internet connected objects embedded with electronic, sensor and other network connectivity devices are used for the learning process and interactions. The exciting and upcoming IoT objects are provided with security, privacy and improved with the high secure level for communication. Each IoT objects are effective, intellectual and increase the level of comfort for automated technology with the unique identifiers. IoT technologies can places in many useful platforms with IoT devices and applications. The main purpose of this survey paper is to discuss about the current status of the Internet of Things in our day to day life with IoT devices and applications. This can be helpful for the people who are new to IoT research work.*

Keywords: *Internet of Things, IoT applications*

1. INTRODUCTION

In our daily lifestyle technology takes place in different tasks. Internet of thing is an ever growing technology that require an IP address for internet connectivity to connect with the physical devices. It can be communicate with other objects through the internet-enabled devices without the requirement of human - machine interactions. It's referred as Machine to Machine network. IoT is the upcoming generation revolution in every field. Interconnection of the devices makes the world smart, to done with work easier at anywhere, anytime and in all possible ways.

The basic concept of Internet of Things is transferring the data between internet enabled devices. It can be identified the object with radio frequency. But RFID is not an only technique used. There are some sensors networks with wireless sensor network are also used in different environment to sense the IoT objects. The effectiveness and control of the process with the privacy measure. The unauthorized access on the action done to data generation is less. These are two main advantage of Internet of Things.

The data collected with different sensors and devices. It can be in different form of pattern such as text, light, temperature, sound etc. Integrity and pervasive pattern of the devices is well designed tasks of sending and receiving data into the real-world.

The goal of the Internet of Things to provide a modern lifestyle to easier through connecting smart devices, applications and technologies for day to day. There are many ideas based on iot objects are implemented by the government. In medicine, education, business sectors IoT plays a vital role. Most of the monitoring and analyzing process the data are done with Internet of Things devices.

2. IOT TECHNOLOGIES

Internet of Things has several of technologies to implement communications. They used of the tagged object with each other through the internet. If all the objects in our day to day life is interconnect, the computer would manage and inventory them with flow what we need.

2.1. RADIO FREQUENCY IDENTIFIER

Radiofrequency identifier is used to send and receives to and from the object which are tagged with the internet using the radio frequency waves. RFID is fast, reliable and doesn't need any kind of physical connection between the tagged objects. It has a microchip label with certain devices which are transfer the information. There is a radio frequency identifier antenna its works with it two tags. Active tags contains the circuit of microchips and it sends a stronger signal to the reader due to battery containment in it allows to read ranges from hundred feet. Passive tags has no batteries, so reader sends it power to the passive tags to create a current which than batch up the power with microchip circuit. It can allows to read ranges from thirty feet. This technique is mostly used by sending radio waves for tracking and identification.

2.2. NEAR-FIELD COMMUNICATION

Near-Field communication is a high frequency wireless communication technology with short range. It's an extension of radio frequency identifier. In radio communication it is established by touching two devices in certain centimeters. NFC is the combines of two technologies. The wireless reader receives the signals for radios which are default set in tiny chips. While the reader activating the very short range radio signals it allows the

read the small amount of the tags stored in the microchips tags. All the operations are done with two modes. Active mode both devices with NFC chip undergoing with the exchange of data are create an electromagnetic signals and transfer it with ring data. Passive mode one is an active device and other used the electromagnetic signal to exchange data. The main advantage of Near-field communication is no need of any special software, no manual configuration and settings. Its cost is cheap. Connection is instant. It's an efficient technique to transfer the data in very short range.

2.3. WI-FI

Wireless-Fidelity is for wireless wide area network with IEEE 802.11 communication standard. Wireless Technology is a reserve of wired technology, used for connecting devices in wireless mode. Wi-Fi works on both data link and physical layer.It connects the computer to eachother and to the internet. Using Ethernet cables user can create a large network by connecting many access point of Wi-Fi network. The security progress of Wi-Fi with three techniques.1) Wired Equivalent Privacy is the encryption process in IEEE 802.11 standard. 2) Wi-Fi Protected Access is improves the encryption security over WEP. 3) Wi-Fi Protected Access2 is with most Advanced Encryption Standard technology. The three techniques are for improving the security of the network. Wi-Fi hotspot is enabling the device to connect with the internet wirelessly. Hotspot in any public transport is used to get the geographical location of it. It has a readily accessible wireless network. It's simple and cost of establishing the connection is less.

2.4. BLUETOOTH

Bluetooth is a wireless communication device use radio waves for the transmission based on the IEEE 802.15.1 standard. Without any interruption any number of different devices can communicate. It is open standard and supports point to point and multipoint application for digital voice and data transmission within short-range of 50 meters two devices can connected together , so cord tie-up between the devices is cutoff. The range is 10 to 100 meters for mobile and business users. Point to Point application is one to one transmission referred as master-slave relationship. Using piconet devices get the point to multipoint broadcast between them. More than one connection can be done. Each piconet get maximum 1 mpbs capacity. It consume low power, low cost and short range for radio link. For battery powered devices it enables high performance. The Bluetooth protocol stack is the heart of the Bluetooth which provide good layers of functionality. It is defined as a layered protocol architecture consisting of core protocols, adopted protocols and telephony control protocols. Its ease to use, mass production can be done in low cost.

2.5. CLOUD COMMUNICATION

IoT cloud communication is the facility path for the real time capture, visualization, data analysis, decision making and management of related data as a cloud server service provider. There are lot of cloud based application used for the transmission of the data between the users. It can be accessed from anywhere and anytime when the requirement of data is raised. It's a remote internet infrastructure called as platform. Hardware, software and any network services can be used for transformation of the data.Cloud centric IoT that handles processing and computation of the IoT data and manage it in cloud. It provide object in multiple location. IoT centric Cloud provide to work with large amount of data and deliver it to all network. Processing and storage of the data source for the user is maintain.

3. SENSOR

Internet of Things ecosystem need two kind of things for the processing. They are physical devices and network. IoT system consists of the sensor that connected directly or indirectly to IoT network. The purpose of the sensor is to collect the data from the connected surrounding. Every IoT applications and devices doesn't need same kind of sensors.

TYPES OF SENSORS

There are different types of sensors which are used to sense the data required in different environment. They are,

- Temperature sensor
- Speed sensor
- Water sensor
- Oxygen sensor
- Motion detection sensor
- Level detection sensor
- Pressure sensor
- Chemical sensor
- Sound sensor

According to the output and data type sensor are two types. Digital and analog for the output type. Scalar and vector for the data type.

3.1. ANALOG SENSOR

Analog sensor directly measure the quantity of input and producer output signal. There are various analog sensor are used. Analog sensor can finds the changes in continuous moving in nature. The light sensor, sound sensor, temperature sensor and accelerometer are some of the analog sensors. Car Speedometer – Needle moves farther right as you accelerate. The change in the position, velocity are measure continuously according to it.

3.2. DIGITAL SENSOR

Digital sensor are interface with microcontroller using Serial Peripheral Interface bus so it is easy and straightforward to deal with the output. In this kind of sensor signals are directly convert into digital signal output within the sensor itself. Digital sensor produce an output signal in binary form of logic "1" or logic "0". Most commonly they are used for analytic measurements. They create a discrete value of the signal in serial transmission form of bits or the combination of the bits into single bytes of parallel transmission. Digital temperature sensor reading and continuous variation in temperature can be more accurate in digital sensor.

3.3. SCALAR SENSOR

Scalar Sensor measure the quantity magnitude and produce the output signals or voltage. Physical quantities such as temperature, color, pressure, strain, etc. they are sufficient to convey a data only with magnitude which are scalar quantities

3.4. VECTOR SENSOR

Vector sensor measure the quantity magnitude as well as the direction and produce the output signal and voltage. Physical quantities such as sound, image, velocity, acceleration, orientation, etc. They are not sufficient to convey the complete information only with magnitude which are vector quantities.

4. APPLICATIONS

In today's world Internet of Things application are increased in many numbers. The usage of the application makes human begin to save their time. Direct and indirect approaches of an application takes place in every field. Smart cities, smart hospital, smart universities, smart banking and so far.

4.1. WEARABLE

Wearable application of IoT is the mass demands required in the world. They avoid the problem of carrying the gadgets with heavy weights. They can sense and transfer the information of the user who are wearing it. These devices can gather the data about health, fitness etc.

4.2. SMART HOME

With IoT application the home product can be connected with each other. It makes the live easier, convenient and more comfortable. For example, it turn off the light when there is no one in the room.

4.3. INDUSTRIAL IOT

In industrial field, it helps to increase the productivity and efficient usage of the products in large numbers. The concept of IoT in the industries is on growing process with right potential power.

4.4. SMART CITIES

Smart cities are generate with IoT application for the proper development. The monitoring and sensing the activities in large amount of population is become easier. The result can be analyzes and use for future progress.

4.5. CONNECTED CARS

Connecting the cars with each other through IoT application via internet shared inside and outside the cars. Its helps to communicate with the other car drive and make an alert in any emergency situation. The sense of instruction to follow the traffic rules.

Internet of things and its application

5. CONCLUSION

World has developed with lot of application and technologies through internet. The technologies makes a life easier and simple. The concept of Internet of Things is to improve the infrastructure and communication with each other by connecting smart phones and smart devices in our life. IoT application used by various sector for maintenance. This paper has a survey on some of the Internet of things technologies and their roles in our life through an IoT application.

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