

A DETAILED STUDY ON INTERNET OF THINGS

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Abstract: Now days, internet is not something that needs an introduction. People are very familiar with the idea of it. People also claim to know everything about the internet, but do they really? There are still a lot of things or features that we don't know about the internet yet. Similarly when we talk about internet of things or commonly known as IOT, it wasn't officially known until 1999, but in the year 2013, it evolved and people got to know more about it. In this proposed paper, we are doing a detailed study on internet of things. This paper will give you a detailed knowledge about the history, advantages & disadvantages, applications and also the security risks of Internet of Things (IoT).

IndexTerms–Internet of Things, IoT, Consumer, Commercial, Industrial, Infrastructural.

I. INTRODUCTION

With advancing growth of internet, the purpose was to globally connect everything to it. The requirement of internet in devices grew day by day. The concept of communication between two devices can be seen as a new technology. But the concept of Internet of Things goes way back to 1999. Kevin Ashton called it “Internet of Things” because it provided communication between the devices with the help of internet.

The first question is always “What is Internet of Things”? The Internet of Things can be understood as a connection between various physical devices through internet. The main purpose of IoT is to exchange the data, whether with server, centralized systems or other connected devices. IoT has been involved in our lives now that it is being used in homes, medical centres, transportation, manufacturing, agriculture and what not. We use many IoT devices in our daily lives too but do not recognize them as one. IoT can make many applications but it also increases the risks of cyber-attacks.

II. HISTORY

IoT was not officially known until 1999. Yet the first example of IoT is from 1982, when a smart device was invented. It was a coke vending machine or coca cola machine. It was the first machine which was connected to internet. Its main purpose was to report about its inventory being available or not and if the drinks were cold or not.

In 1999, Kevin Ashton of “Procter & Gamble” gave the title “Internet of Things”. He mainly prefers calling it Internet for Things. Kevin also saw Radio-Frequency Identification (RFID) as an important factor for internet of things, as it will help it to manage every individual thing. Kevin named it Internet of Things because he thought that's what perfectly defines IoT. IoT was developed with the idea that every things or objects will be connected to the internet and communicate with each other. CISCO systems estimated that the IoT actually came into existence between 2008 and 2009.

III. APPLICATION

With the rapid growth of IoT, it can be depicted that soon every field will be using IoT in their daily lives. IoT has been proven useful for not only offices but homes too. It has provided great benefits to consumers and business etc. Many IoT applications are being used in homes, medical centres, manufacturing and agriculture etc.

To know more about IoT applications we often divide them in four categories:-

- a. Consumer
- b. Commercial
- c. Industrial
- d. Infrastructural

a. Consumer Application:-

Most of the IoT devices are created for consumers, like smart home devices, automation devices for home, voice controls etc. Here smart home devices include lighting, air conditioning, security systems, heating, media etc. It helps people because the devices have sensors, which help them ensure the lightings or any electronics are turned off after its use.

IoT also helps consumer who have any physical disability or elders. It provides voice control so that the everyday works are made simple and easy for them. This also provides additional safety features. These features can be sensors which identify any medical emergencies and help them achieve a quality of life.



Figure 1.1 Smart Home Devices (Consumer Application)
(Image Credits: Google)

b. Commercial Application:-

IoT can also be used for commercial use, such as for medical purpose, for collection of data and monitoring the medical centres. It can also provide us information in case of any emergencies. It can provide wristbands which can monitor the heart rate or blood pressure of any individual.

IoT can also be used in transportation to know about traffic, vehicle and its parts. This can help drivers to manage their vehicles easily also with drowsiness alerts, it can reduce the chances of accidents. We currently also use IoT devices like GPS, Auto drivers mode, Temperature notification etc.



Figure 1.2 Smart Lock used in companies (Commercial Application)
(Image Credits: Google)

c. Industrial Application:-

IoT has been beneficial for industries as it provides devices with sensors that help a lot in manufacturing phase, to check a product's quality and help in other processes too. It helps in managing network control and manufacturing equipment.

IoT helps in agriculture in various ways by providing numbers of application such as data collection of temperature, rainfall, humidity, soil content and pest infection too. This data helps farmer to take decisions to improve the factors that need improvement and it also minimizes the risk of crop failure and waste.



Figure 1.3 Man controlling Industrial Machines with the help of IoT (Industrial Application)
(Image Credits: Google)

d. Infrastructural Application:-

IoT Application has helped in the process of monitoring and controlling infrastructures like bridges, railway tracks and roads etc. It helps in controlling any consequences before it's happening. It also helps in quick maintenance of these infrastructures to prevent any accidents. A lot of smart cities are being developed with the help of IoT.

The above applications are just an example to tell you how and where IoT can be used or installed. There can be more applications that have not been included here.



Figure 1.4 IoT being used in Infrastructures (Infrastructural Application)
(Image Credits: Google)

IV. ADVANTAGES & DISADVANTAGES OF IoT

IoT provide many application and services to user but it also has some advantages and disadvantages. Firstly let's talk about advantages of IoT.

A. Advantages:-

The advantages of IoT are following:

1) Communication:

IoT helps in developing communication between devices i.e. Machine-to-Machine (M2M) Communication. It also provides total transparency with great efficient and quality.

2) Automation and Control:

With the help of IoT devices are connected and controlled digitally through wireless architecture. It encourages automation without human intervention.

3) Monitor:

The best advantage of IoT is monitoring. It knows exactly what you want? How you want? And when you want it? IoT is making smart devices only to fulfill the above demands.

4) Information:

Great Power comes to those with Great Knowledge. Wouldn't it be great if you make informed decision for small as well as large things? No Worries! IoT helps you by providing information about anything and everything.

5) Better Quality of Life:

The main purpose to build any IoT device was to make the living easy for user. It not only makes living easy but also helps in achieving a better quality of life.

B. Disadvantages:-

The disadvantages of IoT are following:

1) Privacy / Security:

The biggest disadvantage of IoT is privacy and security. As all the system is connected to network so it makes easier for the hackers or attackers to enter in your system and steal any delicate information or data.

2) Complexity:

IoT systems are consisting of complex systems and networks, which sometimes result in failure. Automating your whole life can easily turn into a curse.

3) Safety:

Imagine a hacker entered your system and changed the data and then the consequences can be hazardous. Your crucial data will also be exposed to the hacker which he can use in a wrong way.

4) Loss of Jobs:

The companies are adapting IoT applications, it saves them money but it cost many people their job. The automation can replace the people working at the company. At this rate, the company won't need employees to do a certain job; instead they will be using machines for the same. This could increase unemployment.

5) Technology takes Control of Life:

We live in an age where we can't stand without the technology; we are always checking phones, using technologies for our day-to-day activities. And with the help of IoT it has been a piece of cake. But is it better for us? Are you okay with allowing technologies to take the control of your life? Sooner or later we will be dependent on technologies for even a smallest task in our lives.

V. SECURITY RISK

With fast growing technologies, there are always threats of security. It's always a major concern with IoT that its development is done so fast without considering its security challenges. People use IoT for the purpose of data collection, controlling another devices and also for the management of any organization, so if any hackers or phishers attack the system, they will be able to get in and control the system by themselves, they can also misuse the data stored in the systems. With the rapid development and growth of IoT, Government is also more concern about the safety and privacy of the user and taking whatever actions necessary to secure IoT devices. You can also prevent IoT devices upto an extent with the help of smart lock, password etc.

VI. CONCLUSION

Internet of Things is an emerging technology which improves the quality of life of humans and also makes it easier for them. It helps the user in various ways. The paper also describes you about the various application in which IoT can be used. It also describes you about the security risks of IoT. Every technology has its pros and cons. Handled in a right way can protect the user as well as the system. IoT is still growing and so will its limits. What we know about IoT now is just the half of it there is so much more to discover yet.

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REFERENCES

- [1] Overview on Internate of Things (IoT) by Mr Vishal Kansagara, Mr Darshan Thoria and Ms Drashti Hirani.
- [2] Internet of Things (IoT): An Overview of Application and Security Issues Regarding Implementation by Hafsa Tahir, Ayesha Kanwer and M. Junaid.
- [3] IoT Compositions by and for the crowd by Ignacio Mansanet, Victoria Torres, Pedro Valderas and Vicente Pelechano.
- [4] IoT: Trends, Challenges and Future Scope by Daiwat A Vyas, Dvijesh Bhatt and Dhaval Jha.
- [5] A Survey on Challenges, Technologies and Applications of IoT by M. Suruthi and D. Nivetha.
- [6] Internet of Things (IoT): Challenges and Future Directions by Ms Yogita Pundir, Ms Nancy Sharma and Dr. Yaduvir Singh.
- [7] IOT- An Overview by Anupama Kaushik.
- [8] A review paper on "IOT" & It's Smart Applications by Vandana Sharma and Ravi Tiwari.
- [9] A Brief History of the internet of things (<https://www.dataversity.net/brief-history-internet-things/#>)
- [10] Why the Internet of Things is called Internet of Things: Definition, history, disambiguation (<https://iot-analytics.com/internet-of-things-definition/>)
- [11] The History of IoT (Internet of Things) and How It's Changed Today (<https://www.techprevue.com/history-iot-changed-today/>)
- [12] Internet of Things – Wikipedia (https://en.wikipedia.org/wiki/Internet_of_things).
- [13] Pros and Cons of Internet of Things (IoT) (<https://www.linkedin.com/pulse/pros-cons-internet-things-iot-bhaskara-reddy-sannapureddy>).