WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

An Overview of Internet of things(IoT) Technology

***Anand Kumar Maurya*[1]**

Thane ,Maharashtra,India

A B S T R A C T

In this digital era, the Internet of things (IoT) is among top fastest growing technology. Internet of things has changed the way of living by changing the normal way of living with a smart way of living. Assuming it is divided into 3 parts, Public, Private and Commercial. Where Public IoT devices are used to provide more enhanced and easier ways for the public like Smart Traffic lights, Smart Road lights, etc. Private IoT devices are used by individuals for Home or personal purposes, Smart home devices, etc. The commercial IoT devices use IoT for commercial usages like Inventory and machine monitoring etc. millions of IoT devices are sold every year, showing how popular it is. New IoT inventions and Innovations come every year rising the popularity of this technology. Even though this famous technology has some flaws, in this research paper we will discuss how this technology works and its effect on our lives in the future.

Keywords: Internet of things, Sensors, Smart devices,Communication, Intelligence, connectivity.

1. INTRODUCTION

Internet is the technology that connects one device to another device all over the world. It is a network of billions of computers and electronic devices from across the world. In our life, it is playing a most important role whether it is used for communication, work, or a business. Using this we can connect with people from anywhere in the world where the internet is available. Embedded devices and systems are microprocessors or microcontroller-based systems bagged with software to perform a certain task or function. IoT uses the same thing in its paradigm, it combines these two technologies to work together and do certain tasks, as the name suggests Internet of things (IoT), where the term internet refers to a Network and the term Things refers to Physical objects like embedded devices, sensors, and actuators, meaning it is a network of hardware devices. In a real-world scenario, IoT is a network of devices. A Smart Pollution monitoring system is an example of this where a sensor monitors the quality of air and sends an alert message if the Air quality index crosses the threshold parameter.

IoT is an independent technology means that could be used for living or non-living things. It can also blend with major technologies like AI, ML, Deep learning, and computer vision making this technology more profitable.

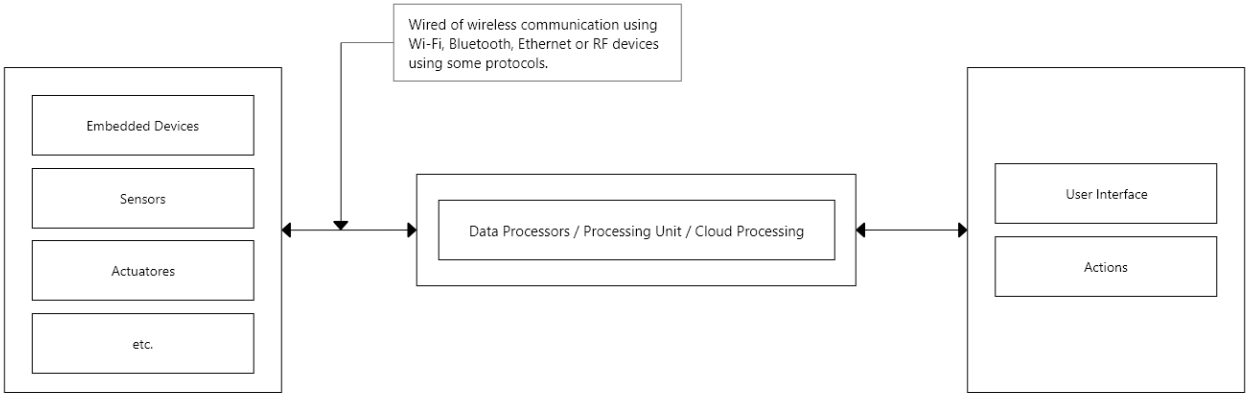
* *Corresponding author.* Tel.: +91 8356005616 .
E-mail address: anand34577@gmail.com

2. WORKING OF AN IOT DEVICE

To work properly most IoT device needs to collect information, from the environment or object after it sends the collected data for further processing through the ugh internet or Machine to machine communication to another device the end device will process the inputs and gives its results.

IoT devices require four main components in their systems to work.

- ***Physical devices***
- ***Connectivity***
- ***Data processing***
- ***Application***



WORKING OF AN IOT DEVICE

2.1.1. Physical Devices: Physical devices are used to interact IoT devices with the real world, it consists of hardware devices to do the tasks. Examples of physical devices are Sensors, Actuators, or embedded devices.

2.1.2. Connectivity: After the data is collected from physical devices it needs to be sent to the servers of processing used for further operations where connectivity played a major role by connecting the processing unit and physical devices. Generally, IoT it is using low-power communication modules which are power efficient and provide good results. Examples of connectivity are WIFI, WAN, Bluetooth LE, RF Modules, etc.;

2.1.3. DataProcessing: Once the data gets collected it's stored in somewhere the cloud or on a local system where it needs some further processing to convert raw data into useful information. This is done by processing units. Processing units process the data and if any discrepancies are found it sends an alert to the IoT device or user to take certain actions on it.

2.1.4. Application: An application in IoT generally consists of User Interface (UI), after the data has been collected and processed it has to be shown to the user in graphical manner, that's why is the User interface is used to interact user with IoT devices.

2.2. Sectors of IoT

There are many sectors are available in IoT. I have divided it into 3 major sectors.

- **Public**
- **Private**
- **Business**

2.2.1. Public: Public sector is the part of the nation which empowers the country. It plays a vital role in our society. This sector includes public services like waste management, traffic management, infrastructure management, and safety management. IoT is making these services easier than before.

Applications of IoT in public sectors

2.2.1.1. Disasters Management: Disasters are the serious problems occurring of the sort periods affecting the community and causing loss of resources at a low or high scale. To prevent this IoT can be very useful, to cater to these IoT devices like sensors, alarms can be mounted into these areas which will monitor the outside environment. Such an IoT-based system with proper software can help in prior alert and notification of disasters that can prevent loss of resources or damage at a high scale. We can predict the occurrence of disasters before it happens.

2.2.1.2. Traffic Management: Popular cities have a problem with traffic, nobody wants to spend their precious time in a traffic jam, managing traffic is the major issue that cities are facing. Using computer vision and IoT, it's possible to broadcast and publish Real-time traffic data to the public, so they can avoid using a route that already has traffic, and using AI can provide a better solution to avoid traffic jams like which route should be chosen and to travel via public transport service.

2.2.1.3. Reducing Pollution: Pollution refers to making the environment harmful and not suitable, or safe for use. Pollution is the biggest challenge for the environment to overcome there is more campaign already running by the government, individual entity, and community. IoT can be part of this campaign, using sensors it is possible to monitor the Air Quality Index (AQI). It can publish AQI Data, which can be used for taking safety measures before it reaches a bad state.

2.2.1.4. Health care: Health care is the most important thing for the community. In developing countries, the health care system is also developing most people can't reach to hospital for their treatment, because of no hospitals or less staff, with IoT it is possible to monitor patient health remotely called remote health monitoring, which also can provide the medical assistance based on data. IoT devices can able continuously track patients' health, without any human interaction.

2.2.2. Private Sector: Private sector refers to individual persons. It is the most popular technology in this sector as it has more reach than other sectors. Over the past few years, we are hearing about smart appliances, robotic vacuum cleaners, voice control systems, etc. It's part of private sector IoT device automation.

Applications of IoT in private sectors

2.2.2.1. Home Automation: Home automation is connecting devices available in the home with the IoT home automation ecosystem. It provides us to access our home devices from anywhere in the world.

2.2.2.2. Safety devices: Safety is a major concern for everyone. IoT devices can protect you from threats and breaches by identifying and monitoring risks. IoT safety devices can include systems like door locks, security cameras, fire alarms, and access control systems.

2.2.2.3. Accident Tracking: Rapid growth in technology and infrastructure is making our life easier and better. This also increases the demand for vehicles in automobile industries, this is the same for traffic hazardous and road accidents. It puts the lives of people at high risk and danger, if there is a small delay in the ambulance to reach the accident location, can cause the savior damage, or death to a person. IoT-based vehicle accident systems can be useful here. It can able to detect the accident using sensors and send an immediate alert message to nearby hospitals and emergency contact informing them about the accident.

2.2.2.4. Fitness and health tracking: health is the more important thing for every living person. IoT can redefine health sectors with a newer way of technology. IoT devices can be able to monitor the health status of the person and gather information about health data like blood pressure, heart rate, body temperature, etc which later can be used for treatment and countermeasures. A real-world example of this is wearable smartwatches, in recent years it is most popular among people to wear smartwatches to measure their health and fitness which also encourages them to stay fit and set their goal of fitness. It also reminds them of their daily routines. If any illness is detected in its early stages it is also possible to cure it before it reaches to worst condition.

2.2.3. Business: IoT is the most reliable and powerful solution for businesses that are always open to adobe the new technology even IoT devices itself is a business. In a forecast prediction, there will be more than 75 billion IoT devices will be in the world making it the top fortune technology. Below are some applications of it.

Applications of IoT in business sectors

2.2.3.1. Manufacturing: Manufacturing is the production of goods it is a too complicated process and always needs to be monitored by someone. IoT allows businesses to plan, control and optimize their business process by creating a network of machines that requires less monitoring and less human effort.

2.2.3.2. Supply chain: Supply chain is a network between two entities which can be business to business or business to customer. It requires certain activities to reach the product to the end-user. Internet of things devices can be more useful in this section it can track every supply chain activity by maintaining the record of the product and also based on existing history can be able to provide new routes or efficient solutions.

2.2.3.3. Quality control: it is a process of ensuring that the quality of the product is maintained and improved. It involves different techniques and benchmarks for the specification of the final project with the Internet of things devices it is possible to detect anomalies in product workflows. By analyzing the data from sensors, it can change the environment into a more suitable environment. Data collected from sensors can be used in analytics to further improve products.

2.2.3.4. **Improve Customer Experience:** IoT Devices can be able to communicate with the support team automatically if an exception occurred in an operating device for more, the support team can analyze the exception and can provide immediate *solutions, and also can push the new updates over the air (OTA) updates to fix the issue if it's related to software. This will provide more customer satisfaction, improve the relationship and build trust in the brand.*

3. DISADVANTAGES OF IOT TECHNOLOGY

3.1. We 'have talked about the advantages and usages of IoT technology, as every technology has some side effects IoT has some side effects too.

- **Security**
- **Privacy**
- **System complexity**
- **More dependency on technology**
- **Few jobs**

3.1.1. Security: IoT devices need a working connection to the internet, cyber attackers can attack and target the network to gain access to the network. More protocols are still used to prevent this but are still not fully safe yet.

3.1.2. Privacy issues: Privacy is the more important thing in everyone's life. Everyone wants to protect it. IoT devices can monitor and gather your health records, daily routines, and personal data. Leakage to this can cause savior issues.

3.1.3. System complexity: From the outer looks it still looks easy to build an IoT device, but behind the door, there are more, Every IoT device has to undergo certain phases to test and prove efficiency. It is more complex than it looks, It can require the integration of multiple technologies to work on a single device.

3.1.4. More dependency on technology: Even though we know that the future will be full of technology but still these technologies are changing our way of living by making changes in our daily life. Technologies are making our life easier and more comfortable but they are making us also lazy. If we will be more dependent on technology, we can lose control of ourselves and be dependent on it for everything.

3.1.5. Fewer Jobs: Although these technologies are more reliable and efficient. By doing automation it will replace less skilled jobs where most of the people will lose their existing jobs and have to seek newer job opportunities.

4. CONCLUSION

We live in a digitalized world full of technologies. At present, our future is moving forward towards the era of technology with a new hope. IoT technology is impressive itself, it has the potential to go beyond the limits. There is a prediction that 46 billion IoT devices will be connected this year

alone. These stats show how rapidly growing this technology is. Technologies are adopted by us and being part of our daily life. As expected, these will have some effect on our time by changing our mindset and routines. We have to keep a distance from our personal and technology and let them not interfere with each other. Adopting technology is one thing but being addicted is another thing.

REFERENCES

[1]https://ieeexplore.ieee.org/abstract/document/8972389
[2]https://intellipaat.com/blog/future-scope-of-iot/
[3]https://www.techtarget.com/iotagenda/tip/Top-advantages-and-disadvantages-of-IoT-in-business
[4]https://www.aplustopper.com/advantages-and-disadvantages-of-iot/
[5]https://imaginovation.net/blog/8-sectors-benefit-from-iot-development-in-2021/
[6]https://www.forbes.com/sites/insights-inteliot/2018/08/24/how-iot-is-impacting-7-key-industries-today/?sh=f52b7541a845
[7]https://hbr.org/2014/10/the-sectors-where-the-internet-of-things-really-matters