AN ANALYSIS OF THE ROLE OF BIG DATA IN THE INTERNET OF THINGS

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Abstract

Now the world is entering a new generation of computing technology i.e. Internet of Things. Internet of things indicates a system of physical objects which are connected with the help of Internet. The things in IOT can refer to a person or any device which through an IP address. As a result an enormous amount of data is being generated, stored and that data is being processed into useful actions that can command and control the things to make our lives more much easier and safer. By increasing the demand of internet of things, voluminous of data is also increased. To handle the huge amount of data is a big task but big data is the solution for this data problem. By using big data, we are able to store unlimited data in a secured manner, so the demand for big data is increasing day by day. This review paper plays a vital role in focusing the role big data in Internet of Things.

Keywords: Internet of things, Big data, working of IOT, Applications, Nest Learning Thermostat, The Polotech Shirt, Smart refrigerators,Tesla car, Microchip**.**

Internet of Things

The internet of things has the power to transform our world. In simple words, IOT is a concept where any device is connected to other devices via the internet and has an ON and OFF switch. Just like internet has changed our way we work and communicate with each other, by connecting us through the world wide web. IOT also aims to take this connectivity to another stage by connecting multiple devices at a time to the internet thereby promoting man to machine and machine to machine interactions. These devices include coffee makers, washing machines, TVs, music systems, wearables etc., basically it includes any electronic device that can be

controlled through another device. This kind of interaction is called machine to machine communication.

Internet of things has attracted many researchers and industries because of its great impact in improving our daily lives and things. It is being by homes as well as offices to monitor whatever is happening inside and outside. When things like household appliances are connected to a network they can they can work together in cooperation to provide the ideal service as a whole not as a collection of independently working device. This is useful for many of our real world applications and services, and one would for example apply it to build a smart residence. Windows can be closed automatically when the air conditioner is turned on or can be opened when the gas oven is turned on. In this way, people can increase the safety of their families. Other ways IOT solutions are being used in smart cars. Driverless cars are the new goal for the car companies like BMW,Tesla,Google etc.They are using multiple technologies to invent something as solid as driverless cars. Eventual since the advent of the Internet, it has changed our lives from shopping to food, to education, everything has become accessible through internet assistive devices. The internet of things is the newest most trending technology that is taking on the world at the speed of light.

Big Data

The word Big Data refers to the large volume of data, Now days amount of data we produce everyday is truly mind boggling. There are 2.5 quintillion bites of data created per day at our current pace but that pace is only accelerating with growth of the internet of things. Where can this huge amount of data be stored? The solution is big data. By the concept of distributed file system big data handles millions of data every minute. Right now, Big Data companies are only just becoming capable of handling this huge amount of data in a highly secured means. The change we are foreseeing on Big Data front would be the adoption of flexible and scalable solutions to enhance security and data storing. IOT is the latest thing of this generation and its wide adoption is sending signals to Big Data organizations to be prepared to handle data of various types coming in from different types of data.

Working of IOT

In IOT, devices that have inbuilt sensors are connected to IOT platforms which stores data from all the connected devices. The important data is then used to perform tasks that fulfills the needs of the people. When we say the data is stored in the IOT platforms, it does not mean that all the data is useful. Devices carefully select only particular data that is relevant to perform an action. These pieces of information can detect patterns, recommendations and problems before they emerge.

Sensors/Devices

First, sensors or devices help in accumulating every minute data from the surrounding environment. All of this accumulated data can have various degrees of complexities ranging from a simple temperature monitoring sensor or a complex full video feed.

- **Connectivity**

  Next, that data is forwarded to the cloud. The sensors/devices can be connected to the cloud through a variety of methods including cellular satellite,wifi, Bluetooth, low power wide area networks for connecting directly to the internet via ethernet.

- **Data Processing**

  Once the data gets transferred to the cloud, software execute some kind of processing on it. This could be very easy, such as checking the temperature reading within an acceptable range or it could also be very complex, such as using computer vision on video to identify objects.

- **User Interface**

  After, the information is made beneficial to the end-user in some way. This could be via an alert to the user (email, text, notification, etc).

  For example, a text alert once the temperature is just too high within the company's cold storage. Conjointly a user may need an interface that permits

them to proactively check on the system. as an example, a user may need to visualize the video feeds in their house via a phone app or an internet browser. counting on the IoT application, the user may be able to perform an action and have an effect on the system. As an example, the user may remotely change the temperature within the cold storage via an app on their phone and a few actions are performed mechanically. Instead of watching for you to regulate the temperature, the system may have it away mechanically via predefined rules. And instead of simply decision you to warn you of And instead of simply decision you to warn you of trespasser, the IoT system may conjointly mechanically give notice relevant authorities.

Role of Big Data in Internet of Things:- One of the first things that comes to mind when we think about IoT is a massive, constant flood of data hitting data storage. According to the report, the Internet of Things will create about 4.4 trillion GB of data by 2020. This is unquestionably tough to grasp. With the increasing number of connected devices, it is unsurprising that by 2020, more than 10 billion sensors and gadgets would be connected to the internet. Furthermore, data will be collected, analysed, shared, and sent in real time by all of these devices. As a result, without data, IoT devices would lack the features and capacities that have gotten them so much attention throughout the world. The Internet of Things (IoT) is a key source of that data, and here is where the function of big data in IoT comes into play. Big data is gaining attraction as a means of storing data created by "connected devices" generated by the Internet of Things. IoT devices create a vast volume of unstructured data, which is gathered in a big data system. The volume, velocity, and diversity of IoT-generated big data are all important elements to consider. Big data files are used to store a large quantity of data in a big data system, which is essentially a shared distributed database.

Big data's purpose in IoT is to handle enormous amounts of data in real time and store it using various storage methods.

It's not only that big data and the Internet of Things are inextricably linked. They have a significant influence on each other because they help each other. The truth is

that as the Internet of Things expands, so will the demand for big data skills. For example, as the amount of data created by the Internet of Things grows at an exponential rate, traditional data storage technology is already reaching its limits. As a result, more complex and inventive storage solutions are required to meet these increasing workloads, necessitating the update of an organization's big data storage infrastructure.

Applications of Internet of Things

The impact that technology has on our lives is indescribable. Because of technology and science, we are smarter, growing quicker, learning in new ways, and experiencing new things every day. We may sit and think about how far technology has progressed, but our ideas will never be able to equal the heights of contemporary progress. So, although another new technology is on the verge of entering our lives, few people are aware of it. The Internet of Things, commonly known as 'loT,' is the most recent topic of discussion in the world of innovation.

There are few applications of Internet of Things

- In the world of medicine, the Internet of Things has given devices and systems the ability to detect and prevent disease. Wearables that can forecast heart attacks and cardiovascular strokes, for example, can make a person healthier.
- Home automation is a large area in which IT businesses are investing their efforts. Home automation has a number of advantages. Imagine being able to control your room's lighting and temperature without ever leaving your chair. Consider a system that can remember these settings and adjust the lighting and temperature according to the weather. Imagine being able to remotely control your appliances so that your clothes are washed at a specified time or your freshly made coffee is ready when you arrive home! The Internet of Things makes all of this feasible (IoT). It is now prohibitively pricey. As a result, these technologies are exclusively used in the homes of the very rich! However, as the cost of this technology decreases over time, everyone will be able to enjoy its benefits. The Internet of Things (IoT) is

sometimes referred to as the "new electricity" by experts. Another significant advantage of the Internet of Things (IoT) is that it lowers household power expenditures. As a result, even if the equipment is costly, it reduces power waste and lowers the expense.

- IoT sensors have been put in vehicles in the transportation sector in order to track them on the road and around the world. This not only allows businesses to keep a closer check on their vehicles, but it also offers information on fuel economy, driver productivity, and delivery routes.
- In most major cities throughout the world, finding a parking spot is a huge headache. Finding a parking place takes a substantial amount of time, fuel, and energy for commuters. During peak hours, the situation becomes much worse. The Internet of Things (IoT) has the potential to alter this situation. In reality, in many regions of the world, startups have already adopted technology to alleviate this problem. These firms provide a map of all available legal parking spaces in a certain area. The user may then check availability and even can reserve a place from their own home. They can use e-wallets to make payments. As a consequence, the time spent looking for parking is reduced, and the commuter is spared the bother of having to circle the parking lot numerous times before finding a place.
- Imagine being able to regulate the temperature of your home from anywhere, with just a few taps on your smartphone or tablet, and receiving the appropriate temperature before you go home and you can save your waiting time. The most popular thermostat in this 'Smart' category is **the Nest Learning Thermostat,** which was recently purchased by Google. Nest thermostat can not only be controlled from anywhere, but it can also learn from your daily routine and change the temperature of your home without bothering you. For example, if you have set a low temperature at night for the past seven days, this device will remember that and lower the temperature at night automatically. This is a highly useful gadget for energy conservation.

- With these smart bulbs, Philips hue lights have advanced to a new level of innovation. You can now regulate the intensity of lights with your fingertips, thanks to a connection to your cell phone. The combining of a light bulb with mobile technology is the next big thing in home electronics. Rather than purchasing different watt bulbs to fit the mood and situation, simply use your phone to adjust the intensity from dim to medium to full. These bulbs may be configured to dim at night and to act as an alert if an intruder is detected by setting them to blink. Lighting can be adjusted dynamically in response to the surroundings, for as when viewing a movie. These bulbs may also be configured to automatically ON and OFF after a certain amount of time using an ON and OFF timer.

- Ralph Lauren is an American apparel business that pioneered the use of IoT in the garment sector by launching The Polotech Shirt for athletes. Athletes' physiological measurements, such as heart rate, calories burnt, activity levels, breathing depths, and so on, may be recorded by this shirt, which can help them perform at their best. It may be linked to an Apple Watch or an iPhone, and it can track and record all of your iPhone's actions. So, with the iPhone and this Polotech Shirt, you can turn your iPhone into a comprehensive fitness tracker or fitness trainer.

- There are smart refrigerators that not only notify you of eaten food or empty bottles in the fridge, but also allow you to buy them online before they run out. Although large-scale production has not yet begun, these freezers are capable of considerably more**.**

- Tesla's automobile is a significant achievement in this industry. Imagine a car that opens the garage door for you before you get home, and you can manage the temperature, lighting, and charging of the car from afar. All of these features are available in a Tesla car, as well as a Software Framework that allows you to create your own app to manage the car and monitor its speed, position, and battery status from anywhere.

- Now, thanks to the Internet of Things, you can put a Microchip on your pet's collar or connect it to them to follow their movements without having to physically seek for them. Your dogs now have greater freedom, and this also allows you to keep track of their health.

The Internet of things has a slew of more cutting-edge technologies to offer to the globe that will absolutely astound and delight you. We're talking about technology, which will be a marvel of science in a decade's time, playing yet another essential part in our lives. To summarise, the average person's life is about to alter dramatically. Technology that is enabled by the Internet of Things is going to revolutionise the way people do things.

Conclusion

The Internet of Things (IoT) has the potential to significantly improve people's quality of life. The combination of IoT and big data has the potential to open up new possibilities and applications across all industries.In addition, technology has the potential to change many aspects of our society.Connecting those smart gadgets (nodes) to the internet has begun as well, but at a slower pace. The pieces of the technology puzzle are coming together faster than most people imagine to accommodate the Internet of Things. The Internet of Things will affect every area of our life in less than a decade, much as the Internet boom did not long ago and spread like wildfire. The combination of IoT with big data applications expands the area of study in both domains. As a result, both IoT and big data technologies are interdependent and require ongoing development.

REFERENCES

1. whizlabs.com/blog/iot-and-big-data/
2. pdfs.semanticscholar.org/d778/c2d305badd69ea1ad69edee9aef1a3e80507.pdf
3. jaxenter.com/relationship-between-iot-big-data-138220.html
4. data-flair.training/blogs/iot-applications/
5. edureka.co/blog/iot-applications/