

# Internet of Things: Applications And Challenges

Kirti Gupta  
Assistant Professor  
Vivekananda Institute of Technology, Jaipur

Shaina Arora  
Assistant professor  
Vivekananda Institute of Technology, Jaipur

## ABSTRACT

The Internet of Things (IOT) is a network that includes physical devices, electronics, such as vehicles, software, sensors, drives, and network connections so that these objects can collect and exchange data. "The Internet of objects is a system of people capable of transmitting data over a network with interconnected computing devices, machines and digital machines, objects, animals or unique identifiers." Internet of Things (IOT) A huge number of billions or billions of networks that communicate with each other, face many technical and applied problems. Since billions of heterogeneous devices are connected, there are many technological elements, including interoperability and scalability, but determining the investment method for (IOT) is a business problem. There are also serious legal and ethical issues. We need to address the issue of data security and privacy. Since the future (IOT) will be a multinational, multidisciplinary, multi-technology infrastructure, we will look at current global standardization activities to promote global creation and distribution. The Internet of Things (IOT) is a technologically optimistic future when objects are connected to the Internet, providing intelligent interaction with other objects anytime and anywhere. In this study, the implementation of IOT defines the general requirements and objectives of security.

**Keywords:** Internet of Things (IOT), IOT application, IOT challenges, Sensors

## I. INTRODUCTION

The Internet of Things (IOT) is a new revolution on the Internet. You can make objects recognizable, gain intelligence, communicate information about yourself, and access information aggregated by others. The Internet of Things allows you to communicate with people at any time. The Internet everywhere provides interaction between the real world and the physical world and the digital / virtual world. Individuals have digital copies and virtual representations that can perceive, transmit, interact, and share data, information, and knowledge. IOT's vision is to use smart technology, anytime, anywhere [2].

In 2007, in Minnesota, the bridge collapsed, and many people died. Because it was due to insufficient metal plate to handle the load of the bridge. When recovering, you can control stress, cracks and deformation using cement, equipped with smart cement and a sensor. This cement warns to solve the problem before causing a catastrophe, and these methods are not limited to the structure of the bridge.

If there is ice on the bridge, the same sensor in the concrete will detect the information via the wireless Internet and inform your car of this. If you find that your car is dangerous in the future, it will instruct the driver to slow down, and if the driver does not do this, the car will slow down for him. This is just one of the ways to allow communication between sensors and communication between machines.

## HOW TO IMPLEMENT?

We have to build four points in any object to accomplish this task-

- i) Unique Identity (IPV6)
- ii) Ability to Communicate
- iii) Ability to Sense(Touch,Smell,See,Talk)
- iv) Remoted Controlled



**Fig: Internet of Things**

## II. OPPORTUNITY, STATUS, AND APPLICATIONS OF IOT

### A. Opportunity of IOT

IOT creates a huge network of billions or billions of “things” to communicate with each other. IOT does not lose revolution in existing technologies, fully uses existing technology and creates a new communication mode. IOT unites the virtual world and the physical world, combining various concepts and technical components, such as popular networks, device miniaturization, mobile communications, new ecosystems, etc. In IOT, applications, services, middleware components, networks and end nodes are organized structurally and used in new ways. IOT provides tools for the study of complex processes and relationships [3]. New opportunities meet business requirements, and new services are created based on real-time data from the physical world. Anything related to the physical or virtual world can be related to IOT. IOT, intelligent training, rapid deployment, understanding and interpreting the best information, protection against fraud and malicious attacks, privacy protection is an important requirement.

### B. Status of IOT

IOT through a new dimension of “things” for communication and integration can be seen as an extension of the existing interaction between people and applications. In the early stages of IoT implementation, driving domain-related applications is the main development strategy. Subject-oriented applications, there is the possibility of a production management system with its own characteristics of the industry. Application, we can provide a wide range of enterprise management services, which are integrated with the manufacturing industry and business processes. These applications support both home users and industry users. For example, sensor networks and integrated vehicle, global positioning system (GPS) and radio communications technology can provide comprehensive detection, navigation, entertainment and other information services [3].

### C. Applications of IOT.

#### i) CARIQ-

This hardware is powered by Poon, designed for a Plug and Play device that can be used for each vehicle and collect real-time data. This data is collected from various electronic systems in the car and displayed to end users through the application. This device displays important information about the vehicle, headlamp alerts, technical issues, and vehicle maintenance alerts. You can also download driving data, such as location information, towing, crash warning, speed change, battery status.

#### ii) Heart Attack Detection by Heartbeat Sensing using Internet Of Things

This system helps determine the heart rate of a person who uses heart rate detection, even if the person is at home. This system is also useful for hospital monitoring systems, and all patients are monitored by the same person in the server room. This system helps to measure body temperature, heart rate and pulse of a person. We make this system for animals, and we can save them. Once this technology is developed, we can detect heart occlusion by this method with this technology [4].

### iii) IOT for Indian Farmers

India is a country of varied weather with multi-purpose soil. Since there is no sudden rain or accurate weather forecast, Indian farmers face problems such as the cultivation of crops. Even Indian farmers do not have sufficient knowledge of the soil. Farmers do not know which crops are best for growing, as the soil structure changes due to differences in weather conditions. These are some of the problems that farmers face. IOT devices are used by Indian farmers to solve these problems. The proposed solution uses a centralized data server for this solution, which analyzes the data, notifies farmers, and reports the necessary precautions for farmers. This solution also has a portable IOT device, so it can be implemented in any country [5]. India has made a great contribution to the global food market. Therefore, in the network of suicide level sensors to use technology available in the interests of Indian farmers, it is used to connect to actual agricultural products [5].

### iv) Smart parking

A new parking sensor is included in the parking space to detect the arrival and departure of the vehicle. Smart parking provides a broad parking management solution for drivers to save time and fuel.

### v) Smart Home

Smart home is clearly superior and is considered the best Internet application on all measured channels. We are surrounded by various electronic equipment around us, such as a microwave, refrigerator, heater, air conditioner, fan, lighting, etc. Drives and sensors are connected to these devices to make the best use of energy, and these sensors represent the ambient temperature.

### vi) Smart City

Smart City can be widely used from traffic management to water distribution, waste management, urban safety, and environmental monitoring. Its popularity is due to the fact that many smart urban solutions promise to mitigate the real disasters of people living in today's cities. IOT solutions in the smart city area will solve traffic problems, reduce noise and pollution and make the city safer. [6].

### vii) Health

Collect health information and send these groups to a health monitoring center. Therefore, these centers can analyze health and provide valuable reports and information to individuals.

### viii) Smart Cars

Machine-to-machine (M2M) communication, especially smart cars, helps improve accident prevention. These unmanned aerial vehicles offer more than security features, such as saving valuable time and reducing driving voltage.

### ix) Smart Water Supply

In Smart City, we need to control the water supply to fully meet the needs of residents and businesses. Wireless sensor networks provide technology that allows cities to more accurately control the water supply system and determine the maximum risk of water loss. Cities that handle leaks using sensor technology will save significant investments [6].

## III) IOT CHALLENGES

### A. Availability

IOT accessibility should be at the hardware and software level and provide services to customers anytime, anywhere. Software availability refers to the ability of an IOT application to simultaneously serve everyone in different places.

### B. Security Concerns

If the security of an IOT device is not protected, the attacker uses them as an intrusion point and harms other devices on the network. This will prevent the sharing of your personal data with the public.

### C. Privacy issues

These devices collect user data without permission and analyze it for purposes that only the parent company knows [6]. Social inclusion of IOT devices allows people to collect personal data and trust these devices without understanding the future value.

### D. Inter-operas ability standard issues

In an ideal environment, information is required between all interconnected IOT devices. However, the actual scenario is inherently more complex and depends on the different layers of the communication protocol stack between such devices.

## IV CONCLUSION

Today, IOT is being introduced everywhere - it is a human problem, such as smart city, smart environment, security and emergency, smart business process, smart agriculture, home and home automation, healthcare. In this article, we have introduced technology and specifications for the implementation of Internet objects. Later we give some good examples where the Internet of Things is a great success. Finally, we will discuss the unresolved issues that are still being resolved before widespread acceptance of this technology. IOT is a new technology that attracts many researchers from around the world. A great contribution was made to the adaptation of this technology to our daily life.

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