IJMTST is UGC Approved Journal with Journal Id: 43137

*International Journal for Modern Trends in Science and Technology*, 8(S08):39-42, 2022

ISSN: 2455-3778 online
DOI: https://doi.org/10.46501/IJMTST08S0807
Available online at: https://www.ijmtst.com/vol8si08.html

# Fundamentals of IoT

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**To Cite this Article**
Saniya Samreen, B. Anusha and N. Sahithi. Fundamentals of IoT. International Journal for Modern Trends in Science and Technology 2022, 8(S08), pp. 39-42. https://doi.org/10.46501/IJMTST08S0807

**Article Info**
Received: 26 May 2022; Accepted: 24 June 2022; Published: 28 June 2022.

## ABSTRACT

***The Internet of Things (IoT) was developed by author Kevin Ashton in 1999. This section describes the basics of IoT, related to the various layers used in IoT, and specific keywords related to IoT infrastructure. The Internet provides services to IoT facilities. It means the resources of our daily lives are connected to the Internet; the system can be called the "Smart-Home". IoT is not just a deep vision of future technology. IoT infrastructure also defines applications in real-time.***

***KEYWORDS: InternetofThings(IoT),ServiceOriented Architecture(SOA), IoT infrastructure, IoT Applications***

## 1. INTRODUCTION

Internet of Things (IoT) is a network of objects or things that are enclosed with sensors, software, and other technologies for connecting and exchanging data over the Internet. To achieve efficiency and accuracy, IoT allows objects to connect and manage networks remotely across the existing infrastructure. The phrase "Internet of Things" was coined by British technology pioneer Kevin Ashton (born 1968).

Without the interaction of Human Intervention, the IoT is used. Some of the main IoT applications have already emerged in the healthcare, transportation, and automotive industries. IoT development involves many problems such as infrastructure, communications, communications, agreements, and standards. The main motive of this paper is to describe the importance of IoT, like applications, concepts, characteristics, etc.

## 2. APPLICATIONS OF INTERNET OF THINGS

1. Smart homes
2. Smart cities
3. Environment
4. Energy
5. Agriculture
6. Heath and Fitness

## 3. CONCEPT OF IOT

Kevin Ashton suggests the first IoT concept in 1999. IoT is a uniquely identifiable connected device with Radio Frequency Identification (RFID) technology specified by Kevin Ashton. IoT was often described as "a global network infrastructure capable of organizing itself based on actual or actual communication standards and processes".

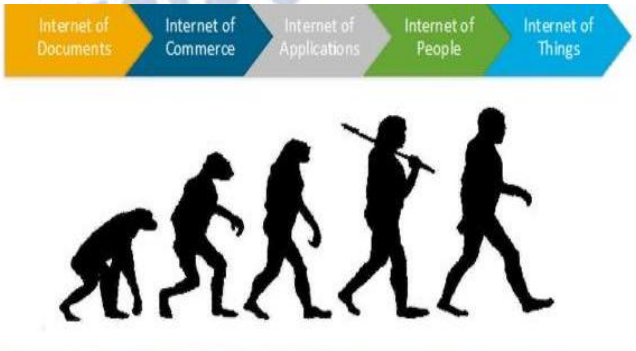



Fig 2.1 Evolution of the Internet

## 4. Evolution Of Internet

The evolution of IoT begins with the first connected network called the ARPANET. The advent of the internet has proven three major categories.

1 Offline Connection.

2 Smart things.

3 Assemble Data over the Internet.

4 Independent land related to construction software.

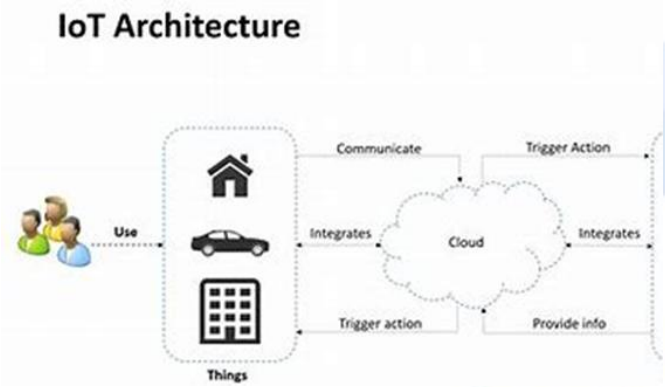
If we look at the emergence of the Internet we can divide it into five periods:

1. Internet Applications.
2. People's Internet.
3. Internet of Things.
4. Internet devices.
5. Development.

The terms "Internet" and "Objects" refer to global and network-based connections based on sensors and communication technology. In simple terms, IoT can be treated as a set of connected devices that can be viewed differently. Up to now, many technologies take part in IoT, such as wireless sensor networks, wireless communication, cloud computing, etc.

Internet of Things has its own identity and qualities that can be used for intelligent communication of virtual things. Undoubtedly, IoT can be treated as a set of connected devices.

## 5. Architecture Of IOT



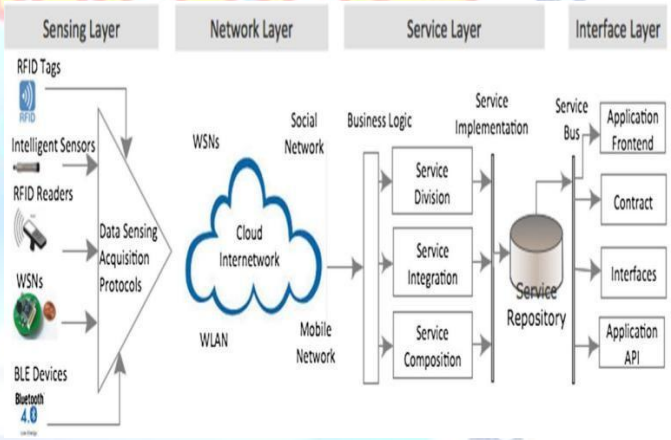

The goal of IoT is to connect things to a network. The architecture of the IoT system provides information about IoT functionality that connects the physical world with the physical. Network, Connectivity, and Processes are components of IoT. By comparison, things may move and need to be communicated with others at the same time. The IoT architecture is used to support the communication between the systems.

## 6. Service – Oriented Architecture

Service-Oriented Architecture (SOA) is a structural pattern where components provide services to other components. The design of IoT architecture includes many online features such as network, communication, business models, processes, and secure communication processes. In building IoT structure, scaling, expansion, and interaction between different devices and their models should be considered. SOA (Services Oriented Architecture) manages a complex system such as a set of well-defined simple objects or sub-systems.

Service-Oriented Architecture (SOA), is designed for four layers. The effectiveness of this

Layers are announced below;




Of course:

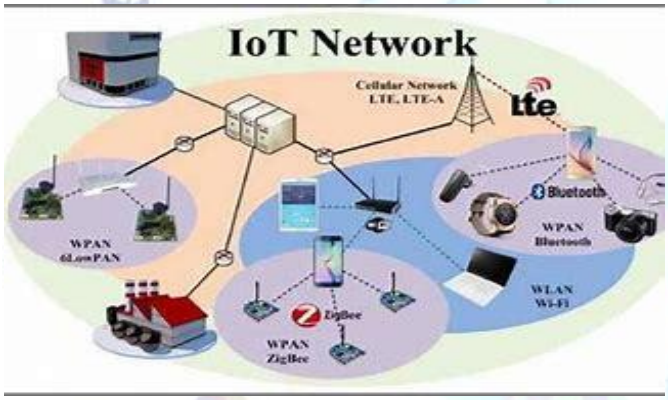
- The Service Layer is integrated with all unused items (items) to hear their status.
- Network Layer is a portion that is used to direct the connection and transfer of data between wireless or wireless communication.
- Service Level is used to create and manage services required by users or applications.
- Interfaces layer contains ways to interact with users or applications.

## 7. Sensing Layer

The Sensor layer represents a type of data, derived from a specific data source, such as web services, standard wireless network networks, and PSNs. In building IoT structure, scaling, expansion, and interaction between different devices and their models should be considered. Locked areas can be monitored for a variety of purposes and applications.

- Communication: This block defines the IoT communication component, which is used for communication using sensors.
- Network: A strong network is essential to share data and provide telephone services.

## 8. Network Layer




The network layer on the IoT connects everything and allows them to realize their location. Required to send IP databases from source to destination.

The network layer contains packet routers and host addresses (used to locate devices on the subnet). Used for automatically detecting and mapping objects

In the network layer, the following issues should be considered.

- Network management.
- Service Requirements.
- Data search
- Security
- privacy

## 9. Service Layer

The service platform is at the forefront of IoT-based healthcare development. The service layer allows applications and services. The Service Layer can also use both software and hardware at a convenient time and platform. The Service layer contains, application programming interfaces (APIs). Internal Service Background All service-based functions, such as information exchange and storage, data management, search engines, and communications, are performed.

### The Service Layer For Task Performance

- Service Delivery: Obtaining items that can provide needed service and information effectively.
- Service Discovery: Incorporates connections between connected devices and defines relationships between items to enable the desired service.

Service APIs: It provides connectivity between services required by users.

## 10.Interface Layer

In IoT, a large number of devices are interconnected. Interface Layers belong to different people, hence do not always suggest the same standards. The issues in Interface Layer are solved through the Interaction of things. Information exchange, communication, and event processing are part Interface Layer. There is a necessity to build an effective interface mechanism to simplify the management and interconnection of things. It also deals with the frontend or API (Application Program Interface).

## 11. Conclusion

In conclusion, the Internet of Things is the concept in which the virtual world of technology is connected over the internet. Over the last few years, IoT has been developed rapidly and a large number of enabling technologies have been proposed. The word IoT describes the smartness of devices. In the future, IoT is used for a wide scope of the Internet. The future of IoT has the potential and it would be limitless. From our bills to vehicles everything would be connected providing a betterlifestyle.

### Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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