IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 8.102 ⁜ Peer-reviewed / Refereed journal ⁜ Vol. 12, Issue 4, April 2023

DOI: 10.17148/IJARCCE.2023.124178

# A Survey on Internet of Things and its Applications

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**Abstract**: Many things have been altered throughout the period of advancement. Every industry, including those in the mechanical and electronic fields, has been embraced by internet and computer technology. Internet of things is one of the most practical and helpful aspects of technology. When we think of convenience, we envision scenarios in which we would work less and accomplish more. We can perform multiple tasks at once when we multitask.

The Internet of Things is also concerned with these goals. The development of the important technology known as the internet of things has been facilitated by the support of coding along with hardware devices. The term "Internet of things" refers to the networked interconnection of smart devices. It develops a clever environment for comfort, security, and conservation. The Internet of Things may enhance people's quality of life. Due to the many advantages it offers, this field is used in almost every sector, including healthcare, agriculture, transportation, household goods, and industry. In this essay, we'll talk about the fundamentals of the internet of things, along with some common gadgets and applications.

**Keywords:** IoT, Sensors, Actuator, Controller, Processor, Devices.

## I. INTRODUCTION

The way we interact with the environment around us has drastically changed thanks to the internet of things. It is made up of numerous components, including sensors, actuators, connected devices, and other physical components that can exchange and receive data without the need for human intervention. IoT devices produce enormous amounts of data, so storing and manipulating that data is also a major concern. Also necessary is the establishment of a secure connection. We can track and manage everything from industrial and agricultural systems to home automation.

IoT is used in rural areas as well as other small businesses and industries, so it is not just a necessity in urban and developed areas. IoT had established itself across a range of large and small machines. IoT is the best solution in this age of making things convenient and easily accessible. Using the technology embedded in smart devices to perform a task or collect information.[1]

### 1.1. Background

The idea of common physical objects being connected to the internet and having the ability to recognize other devices is known as the Internet of Things (IoT), which is a computing concept. In order to enable intelligent applications that make energy, logistics, industrial control, retail, agriculture, and many other domains "smarter," physical and virtual objects with unique identities that are connected to the internet are referred to as "Internet of Things" (IoT) devices. The internet of things (IoT) is a recent revolution that is fuelled by advances in sensor networks, mobile devices, wireless communications, networking, and cloud technologies.[2]

## II. CHARACTERISTICS OF IOT

Dynamic and Self-Adapting: Internet of Things (IoT) devices and systems may be able to dynamically adapt to changing contexts and take appropriate actions based on their operating environment, the context of the user, or the sensed environment. Depending on whether it is day or night, surveillance cameras, for instance, can change from normal to infra-red night modes. Self-Configuring: IoT devices may be able to configure themselves, enabling many devices to cooperate to provide specific functionality. [3]

  

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## III. ARCITECTURE OF IOT

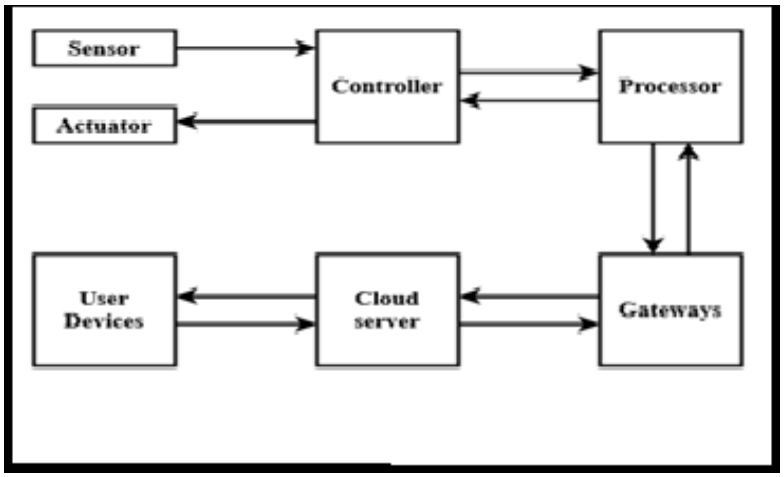


**Fig. 1. Architecture of IoT**

**Sensor**: sensor and actuator are important devices in an IoT application sensor gathers information from the environment and produces an electric or electronic signal. It works on the physical layer.

**Actuator**: An Actuator is a device that makes physical changes after receiving electronic or electrical signals it works on the implementation area.

**Controller**: All the sensors and actuators are connected to a Controller. The controller controls all sensor and actuator. Controller helps in analog to digital and digital to analog of the data as sensor and actuator are analog devices and others devices works with digital data

**Processor**: Collection of all digital data arranging it and processing it is the work of Processor it also removes unwanted data to reduce the size of big data in order to save transmission and storing cost.

**Gateway**: Transmission of the data over the internet is done via gateway. It modulates and demodulates the data for transmission. Gateway is used to transfer the data from IoT process to cloud server for storing. [4]

## IV. DESIGN OF IOT

**Physical design of IoT**:

IoT devices with distinct identities and monitoring capabilities are typically referred to as "Things" in the IoT context. IoT devices can perform some tasks locally while performing other tasks within the IoT infrastructure, depending on the time and space constraints. IoT devices can exchange data with other connected devices and applications (directly or indirectly), collect data from other devices and process the data locally or send the data to centralized servers or cloud-based application back-ends for processing. [5]

Temperature, humidity, and light intensity are just a few examples of the different types of data that an IoT device can gather from its internal or external sensors. Both other devices and cloud-based servers/storage can receive the sensed data. IoT devices can also be of various types, such as wearable sensors, smart watches, LED lights, automobiles, and industrial machines. Almost all IoT devices produce data in one way or another, and when that data is processed by data analytics systems, it can be used to inform further local or remote actions. [6]

**Logical design of IoT:**

An abstract representation of the entities and processes is referred to as the logical design of an IoT system, without delving into the implementation's granular details.

1. IoT functional blocks: An IoT system is made up of various functional blocks that give it the ability to identify objects, sense their surroundings, act on them, communicate with them, and manages them.

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2. Devices that perform sensing, actuation, monitoring, and control functions make up an IoT system.
3. The IoT system's communication is handled by the communication block.
4. Services: An IoT system makes use of a range of IoT services, including those for device monitoring, device control, data publishing, and device discovery.
5. Management: The management functional block offers a number of controls for the IoT system.
6. Security: The security functional block protects the IoT system by offering features like authentication, authorization, message and content integrity, and data security.
7. Application: IoT applications provide an interface that users can use to control and keep track of various aspects of the IoT system. The status of the system and the processed data can both be viewed or analysed by users using applications.

## V. CONCLUSION

Every individual wants a convenient life. It's really a relief that some of our tasks are made easy in this busy schedule. It can act faster than any human being as soon as the problem sensed or the programmed situation occurs it acts at that very moment. Huge task can be easily controlled and executed Conservation of resources, prevention of danger, making life convenient for anyone having disability

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