# Internet of Things: Assurance Provocation

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### Abstract
Nowadays, most of the technology is based on the concept of the Internet of Things, which permits the connection between living to non-living things. Under these circumstances, the interval of manual to automatization is steadily increasing and it pays no attention to the dominant world of things one exercises in a routine life that can't correlate directly to the Internet. The impact areas like healthcare, automobile, retail, apparel, and lifestyle effectively being the subsequently significant technology paradigm shift. This paper has opened up a much larger world of the Internet of things and analyzed security and safety assurance.

### Keywords
Internet of things, Internet of devices, healthcare, smart cities.

## 1. Introduction

### 1.1 History

The approach to the Internet of things first started in 1832 when the telegraph machine was introduced. This machine was able to transfer data between two devices that are far away from each other. After 1960 improvement in IoT gradually increases. In a study, in the year 2020 world population is 7.6 billion, and connected devices are 50 billion from 500 million devices and 6.3 billion people in 2003 [1].

### 1.2 Internet of things

Internet of things, also recognized as the Internet of devices, interconnects devices and is used as applications. These data exchange techniques for behavioral targets connected to the Internet also work as a network of devices and services. (e.g. a Bluetooth watch that can track a person's heart rate and send a notification to mobile). It is a multilayer system divided into three parts: rudimentary foam, which works as a camera network used for surveillance—secondly, used for drone temperature recorded sensors. The third is integrated system likewise plants, industries, controlled with the Internet. Internet of Things is an arrangement of allied computer devices, which works mechanically as well as digitally. The one should provide with a unique identity and the capability to share data between networks beyond compelling person-to-person or person-to-machine. In reality, the characterization of IoT lies between where we screed. Still, it is defined as an international web chain framework in code of procedure by using its composition or interoperable communication. Commonly, IoT is a Strength to generate all around us beginning from (i.e., Machines, Devices, Mobile phones, and Cars) even (Cities and Roads) are expected to be connected to the Internet. In the modern world, we expect intelligent behavior from devices that follow our order designed by the Internet of things". Meanwhile, this is a highly complex thing to develop this fully automatic system and works smartly and connects globally as shown in Figure 1 general architecture of IoT; Which follows basic principles are self-monitoring, self-maintenance, motivation, safety, and security, with the main principle idea of connection from one place to another.
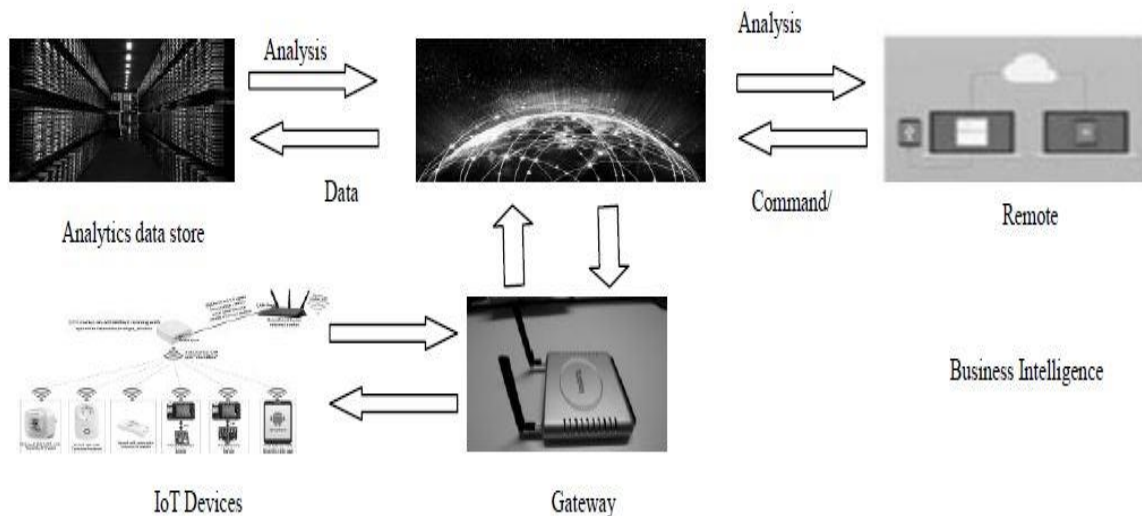
**Figure 1**: General architecture of IoT

These are the primary targets for IoT devices that we use in everyday lives with intelligent connectivity[2]. On the other hand, with IoT wide variety of devices come together on a single platform. We design intelligent systems, sensing systems, the framework for smart devices[3]. A considerable modification originated in our lives with the developing involvement of IoT devices and techniques. This development has shown all lives such as housing, health, transportation, economics, security, energy, agriculture, etc.

## 2. Fields of IoT

The area of the Internet of things is very diverse. It is impossible to discuss all of them on a single platform. So instead, we should discuss some vital application areas.

## 2.1 Health monitoring

The theory of the Internet of things provides the most satisfactory solution for monitoring health. With this system, health records step out from paperwork to digital foam. Now it's the time when we talk about e-health, which is accessible remotely anytime, everywhere with the availability of IoT devices. A radio frequency identification-based technique used to maintain the e-health record of a person from birth is possible to retain the database stored in the server. With just a single click, show a person's whole medical background from a single medicine taken to severe disease or any surgical process. This record is amended regularly within a limited period or by visiting the medical Centre the information stored in individual data as diagnosis, laboratory result, medical history, blood pressure, body weight, bills. This system is dependent on 4C rules, which are connection, collection, correlation, collaboration.[4]

## 2.1 IoT Smart cities

It is the field area where the main goal is to sustain city development and allocate public resources better. The smart city recognized in the European smart city project means by its highest level of smartness in European cities [5] other Government also taking part into IOT based smart cities but still lacking economic dimension. IoT smart cities are considered by giving them green building tags, including waste management, indoor air quality, water resources, and efficient energy use [6].

### 2.1.1 Waste management

Waste management is another issue that is terminated by IoT systems this allowing converting waste into energy. The intelligent waste system provides the solution for easy collection segregation and transportation. It's also beneficial for ecological terms and economics.[7]

### 2.1.2 Air quality

Quality of air reduced day by day ruined by the industrial process, crop residue burnings, fossil fuels transportation, etc. gradual reduction in air quality makes planet worse to live. The international legally binding agreement comes into force, but still, no proper action takes place.[8] In this poor condition IOT based air quality management is the most satisfactory solution to monitor the pollution caused by industry or other sources or calculate air quality.

### 2.1.3 Transportation

IoT based smart cities are the networking of objects with sensing system which gather the data and send to different activated systems based on it. IoT based transportation provide smart parking intelligent traffic lights, accident management, toll system, innovative ticketing system, GPS enabled vehicles, monitor vehicle, over-speed warning, fuel efficiency, the distance of the destination, personal travel information, etc. [9]

## 2.2 Energy-based IOT

In India energy sector is the major contributor to greenhouse gas. IoT-based innovative projects need to be installed to let down the Greenhouse effect, which fulfills our smart city requirement. Energy-efficient devices such as smart grids, smart lighting, smart energy-efficient meters help the consumer for energy loss [10]

## 2.3 Narrowband-IoT

It is based on the low power comprehensive area technique developed for a network range of new IoT-based devices and services. Narrowband-IoT specially designed for improvement in power consumption spectrum efficiency. This approach successfully runs over Indian railway fishing boats, etc., as a pilot project and useful for desktop and mobile applications[11].

## 1.Safety

In modern industries, they ensure the safety of their work with a logo of "safety first". IoT system also helps people be safe outside the industry. Likewise, different safety systems introduced in cars activated during the system observe the risk. Similarly, IoT-based safety protocols follow in other institutions where life is in danger.[12]

## 1.1 Security

Nowadays, security is a big issue in different fields of IoT, such as the banking sector, defense sector, financial institutions, for securing the data[13]. an intelligent security system intelligent surveillance system is designed to lessen human participation and technique is to do their job with hundred percent efficiency. Safety is the term used to be "safe", the purpose of getting immune from hurt or other non-fascinating events. Safety also contributed to the conduct of recognized hazards to achieve an acceptable level of risk. The security referred as are individual or civil associations, categories, systems, or any alternate phenomenon sensitive to undesirable change by the forces of its surroundings [14]

## 2. Challenges

Internet of things is the concern that is in the form of data. It challenging work to analyze, store, secure the data; a network of IoT system network needs to handle the volume and density of devices. IoT still does not provide the guarantee cover to its user for the risk of losing data or safety of data. There is still a lack of government regulation in the IoT field, which means there are still security risks .this issue becomes more complicated. It's not hard to figure out various potential hazard plots flowering in the absence of sufficient regulation. With the increase in IoT devices, it's challenging to manage them and maintain the quality standard due to traffic in the network. It is not easy to maintain standard and quality in this challenging world because things are easily replaced with best.

## 3. Conclusions

IoT technique provides the most acceptable solution for human activities. In the future, IoT devices connect to the human body and collect real-time data with nanotechnology-based gadgets. It's challenging to calculate the areas belonging to IoT because it supports unlimited applications that do not assure minimal control despite security measures and can lead to various types of network attacks even without the user's active participation; the IoT system provides personal information. In the Upcoming years, most of the economies are based on it. The Government's showing their interest in this field to facilitate people by investing in the application area of IoT.

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