ISSN 2348-1196 (print)
International Journal of Computer Science and Information Technology Research ISSN 2348-120X (online)
Vol. 7, Issue 2, pp: (7-12), Month: April - June 2019, Available at: www.researchpublish.com

INTERNET OF THINGS (IOT)

Tanvi Dilip Challirwar

BE. Mechanical Engineer, Gokhale Education Society, College of Engineering, Nashik
E-mail: nikamrohit082@gmail.com

Abstract: **The Internet of Things (IOT) refers to the use of intelligently connected devices and systems to leverage data gathered by embedded sensors and actuators in machines and other physical objects. IOT is expected to spread rapidly over the coming years and this convergence will unleash a new dimension of services that improve the quality of life of consumers and productivity of enterprises, unlocking an opportunity that the GSMA refers to as the 'Connected Life'. In this paper we focus on the various elements of IOT and functions of them.**

Keywords: **IOT, Sensors, GSMA.**

Objective

- To understand fact of IOT.
- To familiarize with elements of IOT.

1. INTRODUCTION

The **Internet of things (IOT)** is the extension of Internet connectivity into physical devices and everyday objects. Embedded with electronics, Internet connectivity, and other forms of hardware (such as sensors), these devices can communicate and interact with others over the Internet, and they can be remotely monitored and controlled. IOT (Internet of Things) is an advanced automation and analytics system which exploits networking, sensing, big data, and artificial intelligence technology to deliver complete systems for a product or service. These systems allow greater transparency, control, and performance when applied to any industry or system. The definition of the Internet of things has evolved due to convergence of multiple technologies, real-time analytics, machine learning, commodity sensors, and embedded systems. Traditional fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), and others all contribute to enabling the Internet of things. In the consumer market, IOT technology is most synonymous with products pertaining to the concept of the "smart home", covering devices and appliances (such as lighting fixtures, thermostats, home security systems and cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smartphones and smart speakers.

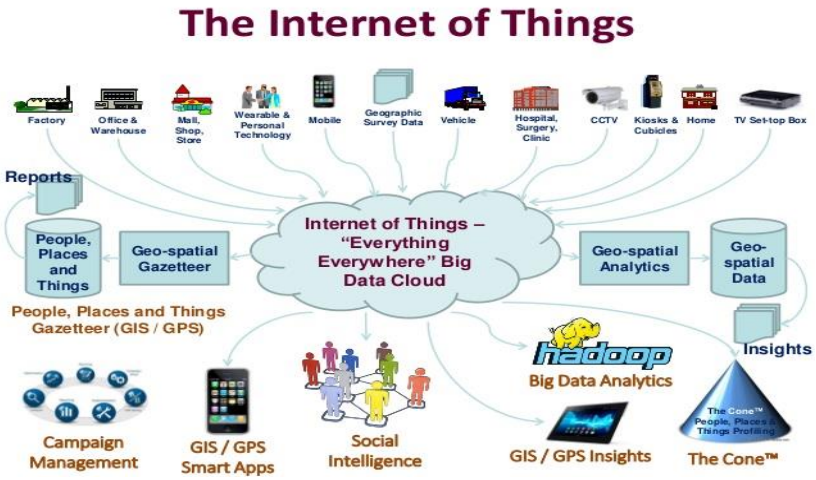

Fig 1.1: IOT Web

ISSN 2348-1196 (print)
International Journal of Computer Science and Information Technology Research ISSN 2348-120X (online)
Vol. 7, Issue 2, pp: (7-12), Month: April - June 2019, Available at: www.researchpublish.com

2. APPLICATONS OF IOT

2.1. Smart City

- **City Lighting Applications**

Lighting is one of the most prevalent examples of IOT applications for smart cities, and many municipalities today are turning to wireless communications for cost savings and energy reduction.Lumca Lighting of Quebec City is putting smart city lighting to work. As an example, this outdoor lighting outfit developed a comprehensive lighting solution — the Lumca Smart Pole with built-in power, connectivity, sensors, and other intelligent features, all of which are configured and managed via Digi Remote Manager, a centralized software platform with a graphical user interface.

Fig 2.1.1: Smart City Light

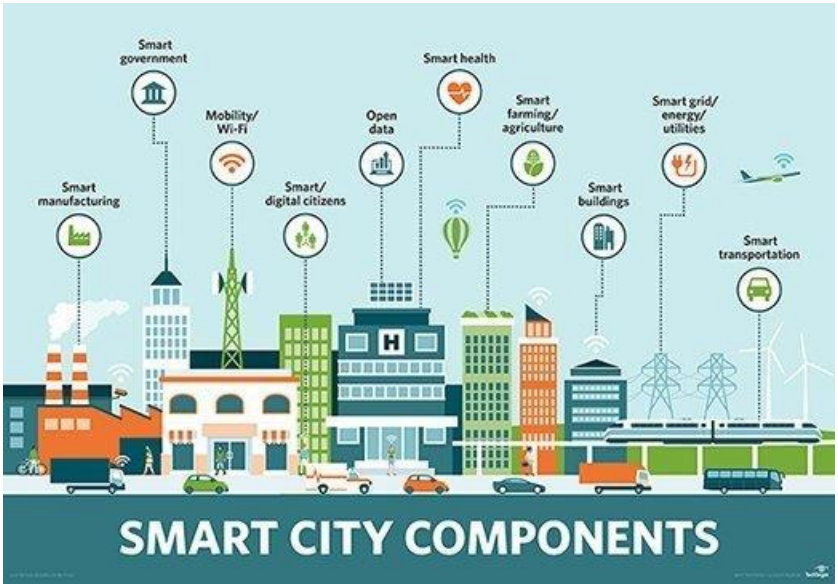

Fig 2.1.2: Example IOT in Smart City

ISSN 2348-1196 (print)
International Journal of Computer Science and Information Technology Research ISSN 2348-120X (online)
Vol. 7, Issue 2, pp: (7-12), Month: April - June 2019, Available at: www.researchpublish.com

2.2. Health Care

The rise of IOT is exciting for everybody due to its different scope of use in various sectors. In Healthcare it has several applications. IOT in healthcare helps in

- Reducing emergency room wait time
- Tracking patients, staff, and inventory
- Enhancing drug management
- Ensuring availability of critical hardware

IOT has also introduced several wearable & devices which has made lives of patients comfortable.

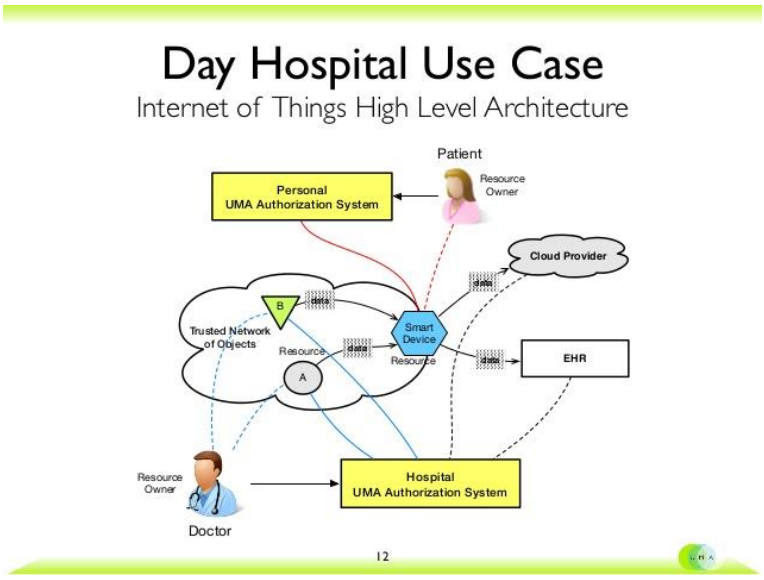

Fig 2.2.1: Example of IOT in Health Care

2.3. Education

In education, mobile-enabled solutions will tailor the learning process to each student's needs, improving overall proficiency levels, while linking virtual and physical classrooms to make learning more convenient and accessible. Mobile education solutions have already been shown to improve learners' proficiency rates and reduce dropout rates, and have the potential to enable, by 2017, the education of up to 180 million additional students in developing countries who will be able to stay in school due to mEducation9.

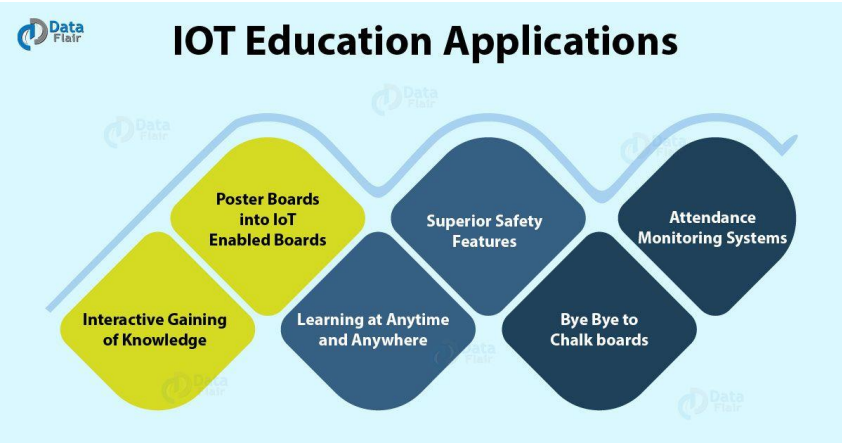

Fig 2.3.1: Example of IOT in Education

ISSN 2348-1196 (print)
International Journal of Computer Science and Information Technology Research ISSN 2348-120X (online)
Vol. 7, Issue 2, pp: (7-12), Month: April - June 2019, Available at: www.researchpublish.com

3. SENSOR

Generally speaking, a sensor is a device that is able to detect changes in an environment. By itself, a sensor is useless, but when we use it in an electronic system, it plays a key role. A sensor is able to measure a physical phenomenon (like temperature, pressure, and so on) and transform it into an electric signal. These three features should be at the base of a good sensor

- It should be sensitive to the phenomenon that it measures
- It should not be sensitive to other physical phenomena
- It should not modify the measured phenomenon during the measurement process

There is a wide range of sensors we can exploit to measure almost all the physical properties around us. A few common sensors that are widely adopted in everyday life include thermometers, pressure sensors, light sensors, accelerometers, gyroscopes, motion sensors, gas sensors and many more. A sensor can be described using several properties, the most important being

- Range: The maximum and minimum values of the phenomenon that the sensor can measure.
- Sensitivity: The minimum change of the measured parameter that causes a detectable change in output signal.
- Resolution: The minimum change in the phenomenon that the sensor can detect.

2.4. Sensor Classification

Passive/Active Sensor: Passive sensors do not require an external power source to monitor an environment, while Active sensors require such a source in order to work.

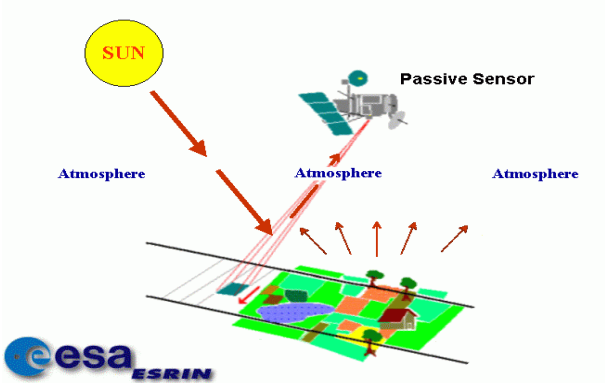

Fig 3.1.1: Passive Sensor

Another classification is based on the method used to detect and measure the property (mechanical, chemical, etc.)

Analog and Digital. Analog sensors produce an analog, or continuous, signal while digital sensors produce a discrete signal

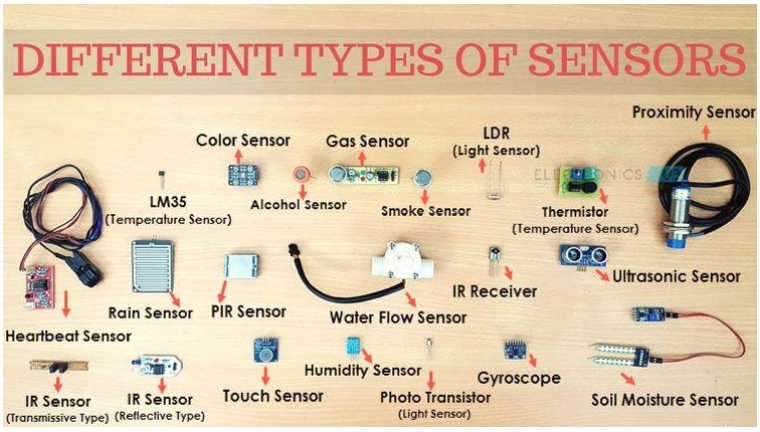

Fig 3.1.2: Different types of Sensor

3.1. How to use Sensors in IOT

It can be used to sense very small objects through a large portion of target. So, generally used in difficult and complex application. Photoelectric **Sensors**. Photoelectric **sensor** is made up of light-sensitive parts and uses a beam of light to detect the presence or absence of an object. The development of prototyping boards and the low price of sensors allow us easily use them in IoT projects. There are several prototyping boards on the market, suited for different projects depending on features and specifications. In this context, we will consider the two most popular boards: the Arduino Uno and Raspberry Pi 2.

This article will explore how to connect different sensors to these boards and how to interact with them.

Before diving into the details on how to use sensors with these boards, it is important to note that every sensor has its own operating voltage range. This parameter is very important because the voltage supplied by the board must not be higher than the maximum voltage allowed by the sensor. Therefore, it is important to read the sensor data sheet carefully before connecting it to the board to avoid damage. The same principle is valid for the output signal, which must be lower than the maximum voltage that the board can tolerate.

4. ADVANTAGES OF IOT

- **Improved Customer Engagement**: Current analytics suffer from blind-spots and significant flaws in accuracy; and as noted, engagement remains passive. IoT completely transforms this to achieve richer and more effective engagement with audiences.

- **Technology Optimization:** The same technologies and data which improve the customer experience also improve device use, and aid in more potent improvements to technology. IOT unlocks a world of critical functional and field data.

- **Reduced Waste:** IOT makes areas of improvement clear. Current analytics give us superficial insight, but IOT provides real-world information leading to more effective management of resources.

- **Enhanced Data Collection:** Modern data collection suffers from its limitations and its design for passive use. IOT breaks it out of those spaces, and places it exactly where humans really want to go to analyze our world. It allows an accurate picture of everything.

5. DISADVANTAGES OF IOT

- **Privacy:** The sophistication of IOT provides substantial personal data in extreme detail without the user's active participation.

- **Complexity:** Some find IOT systems complicated in terms of design, deployment, and maintenance given their use of multiple technologies and a large set of new enabling technologies.

- **Flexibility:** Many are concerned about the flexibility of an IoT system to integrate easily with another. They worry about finding themselves with several conflicting or locked systems.

- **Compliance:** IOT, like any other technology in the realm of business, must comply with regulations. Its complexity makes the issue of compliance seem incredibly challenging when many consider standard software compliance a battle.

- **Security:** IOT creates an ecosystem of constantly connected devices communicating over networks. The system offers little control despite any security measures. This leaves users exposed to various kinds of attackers.

6. GSMA

The **GSM Association** (commonly referred to as 'the GSMA' or Global System for Mobile Communications, originally Group Special Mobile) is a trade body that represents the interests of mobile network operators worldwide. Approximately 800 mobile operators are full GSMA members and a further 300 companies in the broader mobile ecosystem are associate members. The GSMA represents its members via industry programs, working groups and industry advocacy initiatives. It also organizes the mobile industry's largest annual exhibition and conference, the Mobile World Congress, and several other events

7. CONCLUSION

The Internet of Things promises to deliver a step change in individuals' quality of life and enterprises' productivity. Through a widely distributed, locally intelligent network of smart devices, the IOT has the potential to enable extensions and enhancements to fundamental services in transportation, logistics, security, utilities, education, healthcare and other areas, while providing a new ecosystem for application development. In this paper we discussed various elements of IOT and its application.

REFERANCES

[1] Dr. Ovidiu Vermesan SINTEF, Norway, Dr. Peter FriessEU, Belgium, "Internet of Things–From Research and Innovation to Market Deployment", river publishers' series in communications, 2014.

[2] O. Vermesan, P. Friess, P. Guillemin, S. Gusmeroli, et al., "Internet of Things Strategic Research Agenda", Chapter 2 in Internet of Things -Global Technological and Societal Trends, River Publishers, 2011.

[3] Karen Rose, Scott Eldridge, Lyman Chapin, "The Internet of Things: An Overview Understanding the Issues and Challenges of a More Connected World", The Internet Society (ISOC), 2015.

[4] http://tblocks.com/internet-of-things

[5] www.wikipedia.com