

A Review on Internet of Things (IoT)

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Abstract

Now a day's Internet of things is hot topic and fast growing field. IoT is a sort of “universal global neural network” in the cloud which connects various things. It's a new paradigm that has changed the traditional way of living into a high tech life style. The IoT is intelligently connected devices and systems which comprised of smart machines interacting and communicating with other machines, environments, objects and infrastructures and the Radio Frequency Identification (RFID) and sensor network technologies will rise to meet this new challenge. In each and every organization to send information about the people in which we use emails and websites but in most of countries internet access is available for transferring information to people via mobile and on systems which is easier, fast and less cost through internet. You can book tickets, banking, check the traffic, clear your dues, get certificates from the municipality etc. Because of heterogeneity nature of devices there are many issues in IoT like coordination and control, data management, scalability, interoperability, security.

Keywords: Internet of things, Wireless network, Radio frequency identification, Challenges, Security, Privacy, IoT Threats, IoT Technologies, IoT architecture.

Introduction

The term “Internet of Things” was first used in 1999 by British technology pioneer Kevin Ashton in the context of supply chain management. It is a kind of network which is created by the different devices performing separate tasks for some common purpose. IoT is an emerging paradigm that enables the communication between electronic devices and sensors through the internet in order to facilitate our lives. As per the definition of Gartner “Internet of Things (IoT) is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment”. The Internet of Things is not just about connecting devices to the internet, but also making sense of the ‘things’ that are connected. IoT use smart devices and internet to provide innovative solutions to various challenges and issues related to various business, governmental and public/private industries across the world [1]. These devices (sensors) may be camera installed at various locations in the city to monitor the city traffic, metrological department, civic agencies, banks, various sensors, people, and mobile phones, traffic police, civic agencies etc. These devices perform ubiquitous and pervasive computing. However there is no single definition of IoT. Several organizations (CCSA, ITUT, EU FP7 CASAGRAS, IETF etc.) have given their definitions. Internet of Things is very quickly becoming a reality. We can see the proof of it around us. Our devices are getting smarter each day from smart phones to smart T.V to smart car to smart kitchen to smart city. The basic idea of this concept is the pervasive presence around us of a variety of things or objects such as Radio Frequency Identification tags, sensors, actuators, mobile phones, etc. which through unique addressing.

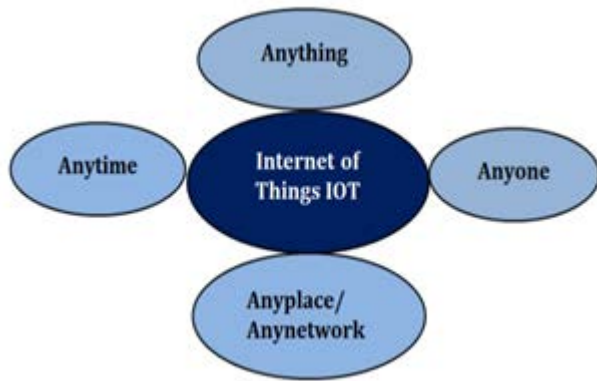


Figure 1: Internet of Things

WHAT IS IoT?

Internet of Things (IoT) as defined by the ICT (Information and Communication Technology) as a dynamic global network infrastructure with self configuring capabilities based on standard and inter operable communication protocols where physical and virtual things have identities, physical attributes and virtual personalities use intelligent interface and seamlessly integrated into the information network. IoT is the inter networking of physical devices, vehicles, buildings and other items embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. The definition of the Internet of things has evolved due to the convergence of multiple technologies, real-time analytics, machine learning, commodity sensors, and embedded systems [2]. 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.

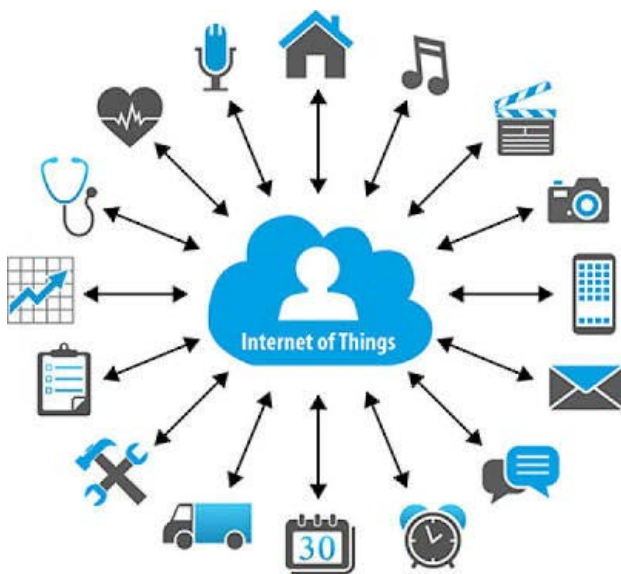


Figure 2: What is IoT

How it works

Devices and objects with built in sensors are connected to an Internet of Things platform, which integrates data from the different devices and applies analytics to share the most valuable information with applications built to address specific needs.

These powerful IoT platforms can pinpoint exactly what Information is useful and what can safely be ignored. This information can be used to detect patterns, make recommendations, and detect possible problems before they occur.

For example, if I own a car manufacturing business, I might want to know which optional components (leather seats or alloy wheels, for example) are the most popular. Using Internet of Things technology, I can:

- Use sensors to detect which areas in a showroom are the most popular, and where customers linger longest;
- Drill down into the available sales data to identify which components are selling fastest;

The information picked up by connected devices enables me to make smart decisions about which components to stock up on, based on real-time information, which helps me save time and money.

With the insight provided by advanced analytics comes the power to make processes more efficient. Smart objects and systems mean you can automate certain tasks, particularly when these are repetitive, mundane, time-consuming or even dangerous. Let's look at some examples to see what this looks like in real life.

Challenges In IoT

- 1. Security
- 2. Privacy
- 3. Standards
- 4. Regulation
- 5. Development

APPLICATIONS OF IoT

1. Wearables
2. Health
3. Traffic Monitoring
4. Fleet Management
5. Agriculture
6. Hospitality
7. Smart grid and energy
8. Water Supply
9. Maintenance management.

Conclusion

Internet of things is a new internet application which leads to an era of smart technology where there exists thing-thing communication rather than human-human communication. Networks and technologies are used in building concepts of Internet of Things such as Radio frequency Identification (RFID), Wireless sensor Networks (WSN) play an important role in IoT applications. IoT has been continuously bringing a progression of mechanical changes in our day by day lives,

which thus makes our life less difficult and more agreeable through different innovations and applications. There is incalculable value of IoT applications in different areas including medicinal, fabricating, mechanical, transportation, training, administration, mining, living space and so on. IoT is used in healthcare, industry, agriculture, transportation, security, utilities, education and other areas, while providing a new ecosystem for application development. There are many privacy and security issues that need to be addressed. If these issues are addressed, then Internet of Things will definitely be global mantra. Governments and international organizations must come together in promoting awareness of the technology both in academic institutions and social platforms, this will enhance and foster adoption in a massive scale.

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