IJCSE International Journal of Computer Sciences and Engineering Open Access
Survey Paper Vol.-7, Special Issue, 4, Feb 2019 E-ISSN: 2347-2693

A Study on Internet of Things(IoT)

N.S. Sanguida[1*], M. Sasikala[2]

[1,2]Dept. of Computer Science), Rabiammal Ahamed Maideen College For Women, Thiruvarur, Tamilnadu, India

Corresponding Author: sanguidaselvam97@gmail.com

Available online at: www.ijcseonline.org

***Abstract*—** Internet of Things is a new pattern which provides a set of new services for the next form of technological development. IOT in the sense, it is a "universal global neural network" in the cloud which connects various things. The form of communication that is either human-device, or human-human but the Internet of Things (IoT) promises a great future for the internet where the type of communication is machine-machine (M2M). This paper aims to provide a future vision , IoT Architecture , Applications and its Challenges.

***Keywords*—** Vision, Challenges, Applications, Architecture.

I. INTRODUCTION

Internet of Things (IoT) term represents a general concept for the ability of network devices to availability and collect data from around the world, and then share that data across the Internet where it can be processed and exploit for various interesting purposes. The IoT is compose of smart machines interacting and communicating with other machines, objects, environments and infrastructures. Now a day's every human beings are connected with each other using lots of communication way. Where most popular communication way is internet , so in another word we can say internet which connect mankind.

Communication capability and remote manual control organised to the next step … how do I automate things and, based on my settings and with sophisticated cloud-based processing, make things happen without my intervention? That's the ultimate goal of some IoT applications. And, for those applications to connect with and hold the Internet to achieve this goal, they must first become "smart" then connected and, finally, controlled. This makes a new class of services to their users for their sophistication.

In 1999, the IoT was coined by Kevin Ashton. However, in the past decade, the definition has been more inclusive covering wide range of applications like utilities, transport, healthcare etc. The definition of Things has changed as technology evolved, the essential goal of making a computer sense information without the aid of human intervention remain the same. A radical evolution of the current Internet into a Network of interconnected objects that not only gather information from the environment (sensing)and interacts with the physical world(actuation /control), but also uses existing Internet standards to provide services for information transfer, applications, analytics and communications. Fueled by the prevalence of devices enabled by open wireless technology such as radio frequency identification (RFID), Bluetooth , Wi-Fi, and telephonic data services as well as embedded sensor and actuator nodes, IoT has stepped out of its onset and is on the verge of transforming the current static Internet into a fully integrated Future Internet. The Internet revolution led to the interconnection between society at an unprecedented scale and pace. The next mutiny will be the interconnection between objects to create a smart environment. In 2011 the number of interconnected devices on the planet overtake the actual number of people. Presently 9 billion devices are interconnected to the Internet. In future, 24 billion devices are expected to interconnect with the Internet.

II. VISION

In 2005, ITU reported about a pervasive networking era in which all the networks are interconnected and everything from tires to attires will be a part of this huge network . Imagine that you are doing an internet search for your watch you lost somewhere in your house. The main vision of IoT, an environment where things are able to talk and their data can be processed to perform desired tasks through the machine learning. A practical implementation of IoT is exhibit by a soon-to-be released. A compact and low-power hardware working together with real-time web software to make this foresight a reality. However different people and organizations have their own different visions for the IoT.. As of HP's foresight, they see a world where people are always connected to their content. Cisco believes in the industrial automation and combination of operational technology. Intel is intense on empowering billions of existing devices with intelligence. Microsoft does not consider IoT as any future technology; they believe that it already exists in today's powerful devices and that the devices just need to be connected for a large amount of information which could be helpful. While, IBM has a foresight of a Smarter Planet by remotely controlling the devices via secured servers. Despite of having different foresight, they all agree about a network of interconnected devices therefore more developments within the coming decades are expected to be seen including that of a new converged information society.

III. ARCHITECTURE

Quality of Service issues as well as it could support the existing network applications using open protocols. Without a proper privacy assurance, the IoT is not likely to be adopted by many. The protection of data and privacy of users are key challenges for IoT. For future development of IoT, a number of multi-layered security architectures are proposed. described a three key level architecture of IoT while narrate a four key level architecture. proposed a five layered architecture using the best features of the architectures of Internet and Telecommunication management networks based on TCP/IP and TMN models respectively. Similarly a six-layered architecture was also recommend based on the network hierarchical structure . So generally it's divided into six layers as shown in the Fig. 1.

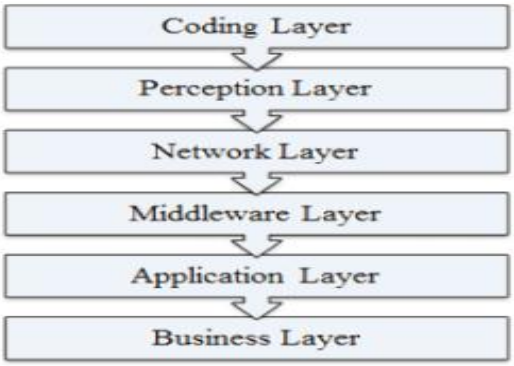

Fig: 1 Layers of IoT

The six layers of IoT are described below:

A. Coding Layer

Coding layers is the foundation of IoT which provides identification to the objects of interest. In this layer, each object is assigned a unique ID which makes it easy to discern the objects B .

B. Perception Layer

This is the device layer of IoT which gives a physical meaning to each objects. It consists of different data sensors in like RFID tags, IR sensors or other sensor networks which could sense the temperature, humidity, speed and location etc of the objects. This layer gather the useful informations of the objects from the sensor devices linked with them and converts the information into digital signals which is then passed onto the Network Layer for further action.

C. Network Layer

The purpose of this layer is receive the useful information in the formation of digital signals from the Perception Layer and transmit it to the processing systems in the Middleware Layer through the transmission mediums like Bluetooth, WiMaX , Zigbee, GSM, WiFi, 3G etc with protocols like IPv4, IPv6, MQTT, DDS etc .

D. Middlware Layer

This layer produce the information received from the sensor devices. It includes the technologies like Ubiquitous computing , Cloud computing which ensures a direct access to the database to store all the necessary information in it. Using some Intelligent Processing Equipment, the information is affair and a fully automated action is taken based on the processed results of the information.

E. Application Layer

This layer perceive realizes the applications of IoT for all kinds of industry, based on the processed data. Because applications promote the development of IoT , so this layer is very helpful to the large scale development of IoT network . The IoT related applications could be, smart transportation, smart planet, smart homes etc.

F. Business Layer

This layer manages the applications and services of IoT and is behind for all the research related to IoT. It produce different business models for effective business strategies.

IV. APPLICATIONS

A. Smart Home

Whenever we think of IoT systems, the most important and orgainzed application that stands out is the smart home, ranking the highest IoT application on all channels. The number of peoples searching for smart homes increases every month by about 60,000 peoples. Another interesting thing is that the database of smart homes for IoT analytics includes 252 companies and startups. More companies are now actively involved in smart homes, as well as similar applications in the fields. The estimated amount of funding for smart home startups exceeds $2.4 billion and growing at a rapid rate. The list of startups includes prominent startup company names, such as AlertMe or Nest, as well as a number of multinational corporations, like Haier, Philips or Belkin.

B. Smart City

Smart city is a big innovation and spans a wide variety of use cases, from water distribution and waste management to traffic management and environmental monitoring.. It is popularaised because that it tries to remove the problems of people who live in cities. IoT solutions offered in the smart city sector solve various city-related problems, comprising of traffic, noise pollution and reducing air and helping to make cities safer.

C. Wearables

Every year, consumers all across the globe await the release of the latest Apple smartwatches. Apart from this, there are many of other wearable devices that make our life easy, such as the LookSee bracelet, Sony Smart B Trainer, or the Myo gesture control.

D. Smart Agriculture

Smart Agriculture will monitor Soil nutrition, Light, Humidity etc and improve the green housing experience by automatic adjustment of temperature to maximize the production. Accurate watering and fertilization will helps to improving the waterBVquality and saving the fertilizers respectively.

V. CHALLENGES

A. Security

Security is an essential part of the Internet and one that ISOC perceives to be equally essential and the mostsignificant challenge for the IoT.

Increasing the number of connected devices and opportunity to exploit security vulnerabilities, as do poorly designed devices, which can expose user data to theft by leaving data streams deficient protected and in some cases people's health and safety (hackable cars, Internet-enabled medical devices and implanted) can be put at risk.

B. Regulation

Like privacy, there are a wide range of regulations and legal questions surrounding the IoT, which need thoughtful consideration.

Legal issues with IoT devices include; conflict between law enforcement surveillance crossborder data flow civil rights and data retention and destruction policies; and legal liability for unintended uses, security breaches or privacy lapses. Further the technology is advanced much more rapidly than the associated policy and regulatory environments.

Regulatory analysis of IoT devices is increasingly being viewed from a technology-neutral perspective legal lens, general ,which seeks to prevent unfair or deceptive practices against consumers.

C. Privacy

The IoT creates unique challenge to privacy, many that go behind the data privacy issues that currently exist. Much of this stems from integrating devices into our environments without us understanding using them. This is becoming more prevalent in consumer devices, such as tracking devices for cars and phones as well as smart televisions. Voice recognition or vision features are being integrated that can continuously listen to conversations for activity and selectively transmit that data to a cloud service for processing, which sometimes includes a third party. The collection of this informations exposes legal and regulatory challenges facing data protection and privacy law.

REFERENCES

[1] Y.Cao, W.Li, J.Zhang, "Real-time traffic information collecting and monitoring system based on the internet of things," in Pervasive Computing and Applications (ICPCA), 2011 6th International Conference,

[2] "WISP" by Intel Labs; It can be accessed at: http://wisp.wikispaces.com

[3] Bob Violino, "Top IT Vendors reveal their IOT strategies". It can be accessed at: http://www.networkworld.com/article/2604766/internet-ofthings/top-it-vendors-reveal-their-iot-strategies.html

[4] Guicheng Shen and Bingwu Liu, "The visions, technologies, applications and security issues of Internet of Things," in E -Business and E -Government (ICEE)

[5] M.Aamir, Prof. X.Hong, A.A.Wagan, M.Tahir, M.Asif, "Cloud Computing Security Challenges and their Compromised Attributes," in International Journal of Scientific Engineering and Technology, Volume 3, Issue 4, pp. 395-399.

[6] P.Fuhrer, D.Guinard, "Building a Smart Hospital using RFID technologies,"

[7] L.Xiao, Z.Wang, "Internet of Things: A New Application for Intelligent Traffic Monitoring System," in JOURNAL OF NETWORKS, 2011

[8] Hui Suo, Jiafu Wan, Caifeng Zou, Jianqi Liu, "Security in the Internet of Things: A Review," in Computer Science and Electronics Engineering (ICCSEE), 2012, pp. 648-651

