A Short Review on Internet of Things (IoT) and its Applications in Communication Engineering

Yenumula Sridhar M. Tech- Dept. of ECE.

Abstract: ***This paper presents an overview on the history, components and applications of Internet of Things (IoT) in the field of communication engineering. The paper highlights the basic things of IoT, its development and components to work with IoT. The emerging areas and applications of IoT in the wireless communication system also briefed in this paper.***

Index Terms— Internet of Things (IoT), Cloud computing, wireless communication systems .

I. INTRODUCTION

Internet of Things: The interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data. 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.

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. [5] 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. The IoT concept has faced noticeable criticism, especially in regards to privacy and security concerns related to these devices and their intention of universal presence. [1]-[6].

1.1 History of IoT:

The concept of a network of smart devices was discussed as early as 1982, with a modified Coke vending machine at Carnegie Mellon University becoming the first Internet-connected appliance, able to report its inventory and whether newly loaded drinks were cold or not. Mark Weiser's 1991 paper on ubiquitous computing, "The Computer of the 21st Century", as well as academic venues such as UbiComp and PerCom produced the contemporary vision of the IoT] In 1994, Reza Raji described the concept in IEEE Spectrum as "[moving] small packets of data to a large set of nodes, so as to integrate and automate everything from home appliances to entire factories".[10] Between 1993 and 1997, several companies proposed solutions like Microsoft's at Work or Novell's NEST. The field gained momentum when Bill Joy envisioned device-to-device communication as a part of his "Six Webs" framework, presented at the World Economic Forum at Davos in 1999.

The term "Internet of things" was likely coined by Kevin Ashton of Procter & Gamble, later MIT's Auto-ID Center, in 1999, though he promotes the phrase "Internet for things". At that point, he viewed Radio-frequency identification (RFID) as essential to the Internet of things, which would allow computers to administer all individual things.

A research article mentioning the Internet of Things was acknowledged to the conference for Nordic Researchers in Norway, in June 2002, which was anticipated by an article published in Finnish in January 2002. The application described there was developed by Kary Framling and his team at Helsinki University of Technology and more closely matches the modern one, i.e. an information system infrastructure for implementing smart, connected objects [4]-[9].

Defining the Internet of things as "simply the point in time when more 'things or objects' were connected to the Internet than people", Cisco Systems estimated that the IoT was "born" between 2008 and 2009, with the things/people ratio growing from 0.08 in 2003 to 1.84 in 2010.

The Figure. 1 illustrates the major components of IoT. It should the target thing connected to cloud through the gateway. The data in the cloud handled by the big data analytics algorithms. So, the whole process should always be connected the internet [10].

II. APPLICATIONS OF IOT IN THE COMMUNICATION ENGINEERING:

The broad set of applications of IoT devices is often divided into consumer, commercial, industrial, and infrastructure spaces. IoT enables vehicle-to-everything communication (V2X), which consists of three main components of connected environment: vehicle to vehicle communication (V2V), vehicle to infrastructure communication (V2I) and vehicle to pedestrian communications (V2P). V2V legitimize vehicles to exchange data, V2I allows them to network with the transport infrastructure (traffic signs and lights etc.) and V2P senses signals from the users smartphones to prevent collisions, involving pedestrians. By constantly analyzing real-time data, V2X designs a transport ecosystem where vehicles, infrastructure and people are interconnected with each other to keep the environment safe from any type of accidents. V2X is the first step to autonomous driving and connected road infrastructure that provides connected cars with needed safety [4], [8], [11], [12].

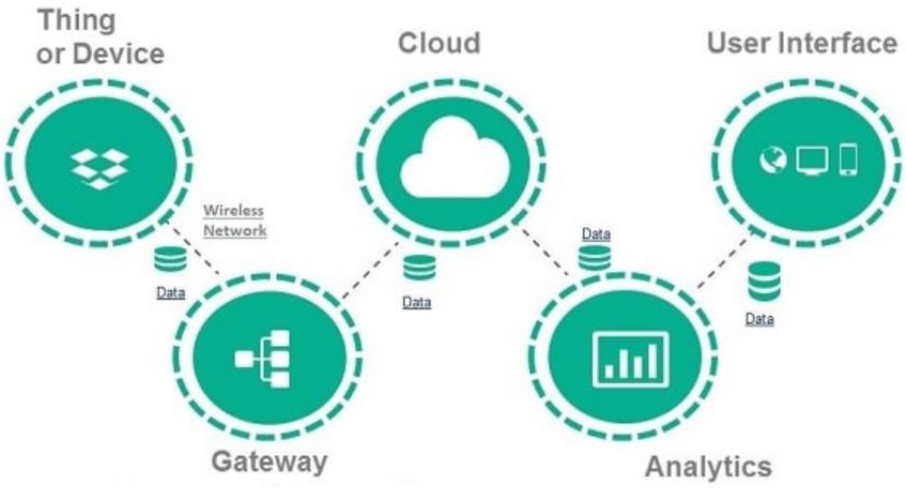

Fig.1. Major components of IoT [10]

III. CONCLUSION

Hence, in this paper a short review on the history, components and applications of Internet of Things (IoT) in the field of communication engineering has discussed. Also, the paper highlights the basic things of IoT, its development and components to work with IoT. The emerging areas and applications of IoT in the wireless communication system also briefed in this paper.

REFERENCES

[1]. Brown, Eric (13 September 2016). "Who Needs the Internet of Things?". Linux.com. Retrieved 23 October 2016.
[2]. Brown, Eric (20 September 2016). "21 Open Source Projects for IoT". Linux.com. Retrieved 23 October 2016.
[3]. "Internet of Things Global Standards Initiative". ITU. Retrieved 26 June 2015.
[4]. Online browsed on 24-04-2019 10.30 a.m. [Available]: https://en.wikipedia.org/wiki/Internet_of_things
[5]. Hendricks, Drew. "The Trouble with the Internet of Things". London Datastore. Greater London Authority. Retrieved 10 August 2015.
[6]. Wigmore, I. (June 2014). "Internet of Things (IoT)". TechTarget.
[7]. "The "Only" Coke Machine on the Internet". Carnegie Mellon University. Retrieved 10 November 2014.
[8]. "Internet of Things Done Wrong Stifles Innovation". InformationWeek. 7 July 2014. Retrieved 10 November 2014.
[9]. Mattern, Friedemann; Floerkemeier, Christian (2010). "From the Internet of Computer to the Internet of Things" (PDF). Informatik-Spektrum. 33 (2): 107¨C121. Bibcode:2009 InfSp..32..496H. doi:10.1007/s00287-010-0417-7. Retrieved 3 February 2014.
[10]. Online browsed on 24-04-2019 10.30 a.m. [Available]: https://www.rfpage.com/what-are-the-major-components-of-internet-of-things/
[11]. Weiser, Mark (1991). "The Computer for the 21st Century" (PDF). Scientific American. 265 (3): 94¨C104. Bibcode:1991SciAm.265c..94W. doi:10.1038/scientificamerican0991-94. Archived from the original (PDF) on 11 March 2015. Retrieved 5 November 2014.
[12]. Raji, RS (June 1994). "Smart networks for control". IEEE Spectrum.