Applications of IoT: A Study

Technical Report · April 2017

DOI: 10.13140/RG.2.2.27960.60169

4 authors, including:

Revu Krishnamohan
Godavari Institute of Engineering and Technology
2 PUBLICATIONS **9** CITATIONS

SEE PROFILE

Special Issue Published in International Journal of Trend in Research and Development (IJTRD), ISSN: 2394-9333, www.ijtrd.com

Applications of IoT: A Study

[1]M.Tirupathi Reddy, [2] R. Krishna Mohan
[1]Automobile Engineering Student, [2]Assoc.Professor
[1,2]Department of Automobile Engineering, Godavari Institute Of Engineering and Technology, Rajahmundry, India

***Abstract*—**This paper describes Internet of Things (IoT). Today almost all devices are equipped with sensors and are controlled by controllers such as from cars to vaccum cleaners, rockets to vernier calipers, air conditioners to water pumps. By embedding intelligence in everyday objects, they turned into smart devices and can be controlled from anywhere in the world. Moreover these devices can also be integrated by exchanging data among themselves. Connecting such devices to mobile phones or computers through internet is a new paradigm and can find lot of scope to researchers and for startups. In this paper it is discussed that the application of IoT in various fields such as home automation, transportation, energy management, manufacturing, medical etc.

Keywords*—IOT, Applications, benefits.*

I. INTRODUCTION

The internet of things (IoT) is the working of physical devices with the help of internet, physical devices which are embedded with sensors, electronics, software's and network connectivity that enable these objects to collect and exchange data. It was first introduced by Kelvin Ashton in the year 1998[1].

Typically, IoT helps in advanced connectivity of devices, systems, and services that goes beyond machine-to-machine (M2M) communications [2]. IoT is mostly suitable for heart monitoring implants, biochip transponders on farm animals, electric clams in coastal waters, automobiles with built-in sensors, devices for environmental/food/pathogen monitoring or field operation devices that assist firefighters in search and rescue operations. More number of people wants to avoid troublesome situations. In the modern world people wants more luxury, So IoT is mostly used in home automation (also known as smart home devices) such as the control and automation of lighting, heating (like smart thermostat), ventilation, air conditioning (HVAC) systems, and appliances such as washer/dryers, robotic vacuums, air purifiers, ovens or refrigerators/freezers that use Wi-Fi for remote monitoring. In the future hundreds of billions of physical devices which are embedded with smart sensors will interact with one another without human involvement, on a Machine-to-Machine basis [3].

II. APPLICATIONS

A. Transportation

The IoT can play the important role in integration of communications, control, and information processing across various transportation. Application of the IoT extends to all aspects of transportation systems (i.e. the vehicle and the driver or user). Dynamic interaction between these components of a transport system enables inter and intra vehicular communication, smart traffic control, smart parking, electronic, logistic and fleet management, vehicle control, and safety and road assistance [4]. Modern automobiles are equipped with sensors which are connected to the internet through control systems. Some of the sensors used in automobiles with their positions are given in fig. 1. IoT plays important role in road safety- systems. Such as collision detection, lane change warning, traffic signal control, intelligent traffic scheduling as in fig. 2.

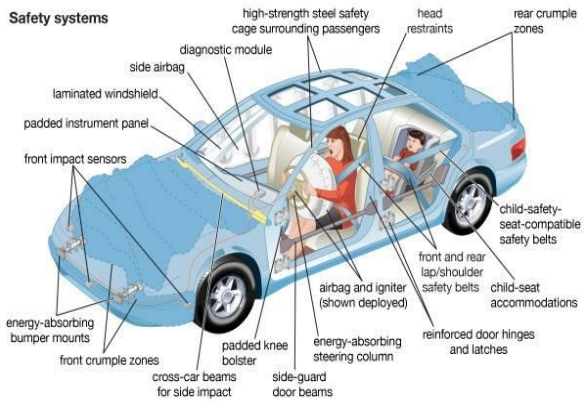

Figure 1: Modern Automobile Layout With Sensors

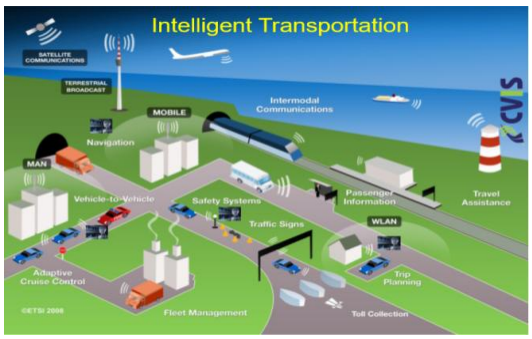

Figure 2: Application of Iot In Transportation [5]

B. Environmental Monitoring

The Environmental monitoring applications of the IoT typically use sensors to assist in environmental protection by monitoring the atmospheric situations.like monitoring the movements of wildlife and their habitats. The physical devices connected to the Internet which are used as warning systems can also be used by emergency services to provide more effective aid [4].

C. Infrastructure Management

Monitoring and control operations of rural infrastructures like bridges, railway track. It is a key application of the IoT. The IoT infrastructure can be used for monitoring any events or changes in structural conditions that can compromise safety and increase risk. It can also be used for scheduling repair and maintenance activities in an efficient manner, by coordinating tasks between different service providers and users of these facilities [6]. IoT devices can also be used to control critical infrastructure like bridges to provide access to ships. Usage of IoT devices for monitoring and operating infrastructure is likely to improve management and emergency response coordination, and quality of service, up-times and reduce costs of operation in all infrastructure related areas [7].

D. Manfacturing

The IoT enables the quick manufacturing of new products and real –time optimization of manufacturing production and supply by using networking machinery, sensors and control systems together.[8]

IoT helps in digital control systems to automate process, to optimize the plant safety and security are interlinked with the IoT. Measurements, automated controls, plant optimization, health and safety management, and other functions are provided by large number of networked sensors.

National science foundation established an industry/University cooperative Research center on intelligent maintenance systems(IMS).The vision is to achieve near-zero breakdown using IoT-based manufacturing [9].In future we can see the e-manufacturing plants and e-maintenance activities [10].

E. Medical and health care

IoT devices can be used to enable remote health monitoring and emergency notification systems. Some hospitals have begun implementing smart beds that can detect when they are occupied and when the patient is attempting to get up [11].

F. Home automation

Home automation is the residential extension of building automation. It involves the control and automation of lighting, heating, ventilation, air conditioning (HVAC), and security, as well as home appliances such as washer/dryers, ovens or refrigerators/freezers. They use Wi-Fi for remote monitoring and are a part of the Internet of things [12].

G. Energy management

Integration of sensing and actuation systems, connected to the internet, is likely to optimize energy consumption .It is expected that IoT devices will be integrated into all forms of energy consuming devices and be able to communicate with power generation [13].

H. Media, Entertainment

Application of IoT in media causes to transfer data through cloud from one place to another place, IoT provides good communication between people through transfer the media one to another [11].

I. Agriculture

By develop the agriculture machinery into smart devices causes control the water pumps and sprayers are controlled anywhere [11].

J. Security

In modern lives there is a fear about thieves, by using IoT in home security devices, the security device is operated by a particular person from anywhere through cloud [14]

III. BENEFITS

1. Quick manufacturing of new products in manufacturing plants with proper accuracy.
2. Use for patient monitoring in hospitals.
3. It can be use as home security devices.
4. It can helps in individual tracking in shipping.
5. IoT systems deliver faster and accurately with minimum utilization of energy, this improves quality of life.
6. By using IoT in transportation causes minimize the traffic jams, and collisions.
7. Transfer the data from one to another people.

CONCLUSION

With the inception of IoT technology one can communicate with his belongings such as home, car, fridge, AC, vaccum cleaner, water pump etc., from anywhere in the world. It improves safety and security of the human beings and their belongings. The future cars are getting ready to give much pleasure to the drivers as well as passengers while their trip. Patients can be monitored by their doctors continuously while their doing their routine duty. The accidents due to human errors can be completely avoided. With the above discussion it is concluded that the application of IoT definitely set new standards for the society worldwide.

ACKNOWLEDGMENT

The authors would like to thank the management of Godavari Institute of Engineering and Technology (GIET), Autonomous campus, Rajahmundry for their kind support towards research and all the Automobile Engineering faculty of the same college for their cooperation.

References

[1] D.Bandyopadhyay,Internet of things:Applications and challenges in Technology and standardization,published online:9april 2011,Springer Science+Business media,LLC.2011.

[2] C.Yen-Kuang,Challenges and Opporunities of internet of things,Intel labs,Santa Clara,CA,USA

[3] Evans, Dave (April 2011). "The Internet of Things: How the Next Evolution of the Internet Is Changing Everything". Cisco. *Retrieved 15 February 2016*.

[4] Ersue, M. Romascanu, D.; Schoenwaelder, J.Sehgal, A. (4 July 2014). "Management of Networks with Constrained Devices: Use Cases". IETF Internet Draft.

[5] www.etsi.org

[6] Gubbi, Jayavardhana; Buyya, Rajkumar; Marusic, Slaven; Palaniswami, Marimuthu (24 February 2013). "Internet of Things (IoT): A vision, architectural elements, and future directions". Future Generation Computer Systems.

[7] Chui, Michael; Löffler, Markus; Roberts, Roger. "The Internet of Things". McKinsey Quarterly. McKinsey & Company. Retrieved 10 July 2014.

[8] Ersue, M.; Romascanu, D.; Schoenwaelder, J.; Sehgal, A. (4 July 2014). "Management of Networks with Constrained Devices: Use Cases". IETF InternetDra

[9] Lee, Jay; Bagheri, Behrad; Kao, Hung-An (2015). Cyber-physical systems Architecture for industry 4.0-based manufacturing systems

[10] Lee, Jay (2015). Industrial Big Data. China: Mechanical Industry Press. ISBN 978-7-111-50624-9.

[11] Debasis Bandyopadhyay, Jaydip Sen, Internet of things: Applications and challenges in technology and Standardization

[12] Ersue, M.; Romascanu, D.; Schoenwaelder, J.; Sehgal, A. (4 July 2014). "Management of Networ kswith Constrained Devices:UseCases". IETF InternetDraft.

[13] Narayanan, Ajit. "Impact of Internet of Things on the Retail Industry". PCQuest. Cyber Media Ltd. Retrieved 20 May 2014.

[14] L. Atzori, L. Antonio, G.Morabito, "The internet of things:A survey," Universit ofcatania ,Italy,DIEE Universitry of Cagliari,Italy.