International Journal of Innovative Research in Science and Engineering
Vol. No.3, Issue 02, February 2017
www.ijirse.com
ISSN (O) 2454-9665
ISSN (P) 2454-0663

THE INTERNET OF THINGS: A SURVEY

[1]Mr. Sandeep G. Shukla, [2]Mrs.Dipali R. Tungar

[1,2] Guru Gobind Singh College of Engineering Guru Gobind Singh Polytechnic, & Research Centre, Nashik(India)

ABSTRACT

This paper addresses the Internet of Things, which offers capabilities to identify and connect worldwide physical objects into a unified system. The Internet of Things (IoT) is a dynamic global information network consisting of internet-connected objects, such as Radio-frequency identification (RFIDs), sensors, actuators, as well as other instruments and smart appliances that are becoming an integral component of the future internet. Over the last decade a large number of the IoT solutions were developed by various enterprises, corporations, academic research institutes, private and public research organisations. In this paper, we describe the key technologies involved in the implementation of Internet of Things.

Keywords: IoT, Sensors Radio Frequency ID, Uniform Resource Locator, URN, Wireless Sensing Network.

I INTRODUCTION

A network is a group of two or more computer systems connected together either through a wired or wireless media.**Wireless networking** is a method by which homes, telecommunications **networks** and enterprise installations avoid the expensive method of introducing cables into a building, or as a connection between various equipment locations.

The explosive development in wireless networks over the last few years resembles the rapid growth of the internet within the last decade. Wireless communication continues to enjoy exponential development in the cellular telephony, wireless internet and wireless home networking fields.

The term Internet of Things was first coined by Kevin Ashton in 1999 in the context of supply chain management [2].Internet of Things represents a general concept for the ability of network devices to sense and collect data from the world around us, and then share that data across the Internet where it can be processed and used for various purposes.

Internet of Things (IoT) makes our world as possible as connected together. Nowadays we almost have internet infrastructure wherever and we can use it whenever. IoTtries to establish advanced connectivity among the devices or systems or services in order to make automation. All things are connected to gather and all information would be interacted to each other over standard and different protocol domain and applications.

ISSN (O) 2454-9665
ISSN (P) 2454-0663

The Internet of Things (IoT) is a novel paradigm that is rapidly gaining ground in the scenario of modern wireless telecommunications. The basic idea of this concept is the ubiquitous presence around us of variety of things such as Radio-Frequency Identification (RFID) tags, sensors, actuators, mobile phones etc. These devices had rough unique addressing schemes. These devices are able to interact with each other[1]. IoT represents the next advancement of the Internet, taking a vast capacity to gather, analyse and distribute data that we can turn into information.

IOT covers a wide range of applications like healthcare, utilities, transport, agriculture etc[3]. Although the definition of things has changed as technology evolved, the main goal of making computer sense information without the aid of human interference remains the same. A drastic development of the current Internet into a network of connected objects that not only gather information from the environment(sensing) and interacts with the physical world (command /control), but also uses existing Internet standards to provide services for information transfer, analytics, applications and communications. Powered by the popularity of devices enabled by open wireless technology such as Bluetooth, radio frequency identification (RFID), Wi-Fi and telephonic data services as well as embedded sensors and actuator nodes, IoT has stepped out of its infancy and is on the verge of converting the current static Internet into a fully integrated Future Internet[4]. The Internet revolution led to the interconnection between people at an exceptional scale and pace. The next revolution will be the interconnection between objects to create a smart environment. Only in 2011 the number of interconnected devices on the planet overtook the actual number of people.

II ARCHITECTURE

The common architecture used for Internet of things is three tier architecture. The bottom tier called as context aware tier consist of wide variety of sensor technology. Internet of things is deployed with many type of sensors, each of which is an information source and different type of sensors capture different content and format of information. Data obtained from the sensor is real time and the sensor collects the environment information at a certain frequency and keeps updating the data. The middle tier called as Network Tier integrates various wireless and wired networks to accurately transfer information of things. Information regularly collected by the sensors on Internet of Things is regularly transferred by the network. The top most tier of IoT architecture is application tier. The application tier consists of applications that export all the systems functionality to the final user.

International Journal of Innovative Research in Science and Engineering
Vol. No.3, Issue 02, February 2017
www.ijirse.com
ISSN (O) 2454-9665
ISSN (P) 2454-0663

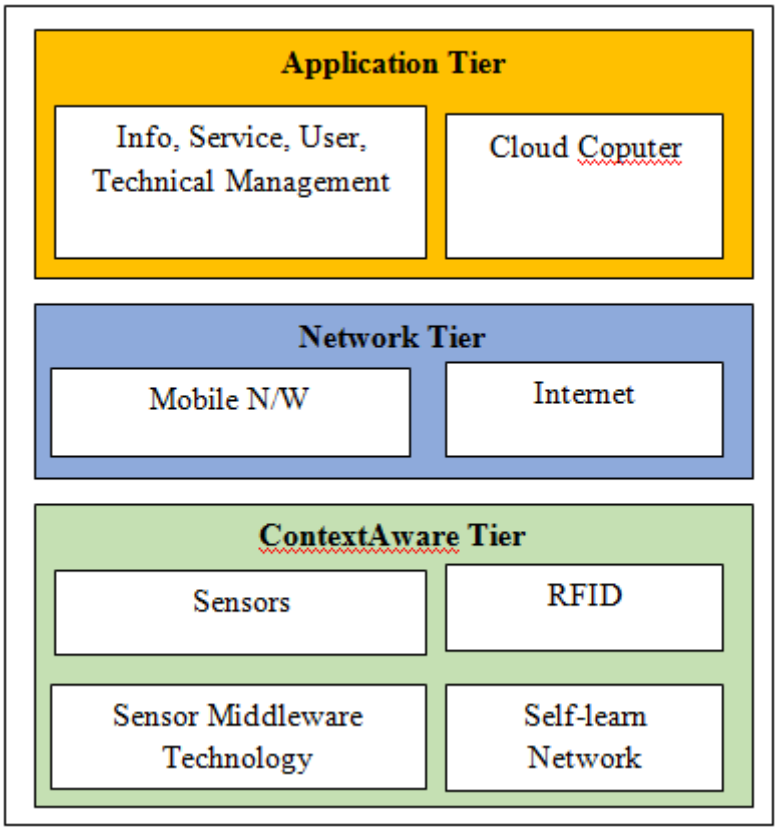

Figure 1: Architecture of IoT

III APPLICATIONS OF IOT

IoT have lots of Potential which helps to develop various applications based on it, of which only a few applications are currently deployed. In the following subsections, some of the important example applications of IoT are mention.

3.1 Automotive industry

By using advanced sensors, actuators there is increased in processing powers of the cars, trains and bicycle. Automotive industry requires the use of smart things to monitor and report various parameters from pressure in tyres to proximity of other vehicles. RFID technology has already been used to streamline vehicle production, improve logistics, increase quality control and improve customer services. The devices attached to the parts contain information related to the name of the manufacturer and when and where the product was made, its serial number, type, product code and so on

3.2 Telecommunications industry

IoT will merge of diverse telecommunication technologies and create new services. In these applications the reader is a part of the mobile phone, and different applications share the SIM-card. NFC do the communications

ISSN (O) 2454-9665
ISSN (P) 2454-0663

among objects in a simple and secure way. The mobile phone can therefore be used as a NFC-reader and transmit the read data to a central server [16].SIM-card plays an important role as storage for the NFC data and authentication.

3.3. Medical and healthcare industry

IoT has many applications in the healthcare sector, with the use of the cell phone with RFID-sensor capabilities for monitoring of medical parameters and drug delivery. It helps in prevention and easy monitoring of diseases, ad hoc diagnosis and providing medical attention in cases of accidents. Implantable and addressable wireless devices can be used to store health records that can save a patient's life in emergency situations, especially for people with diabetes, cancer, coronary heart disease etc. Paraplegic persons can have muscular stimuli to restore movement functions.

3.4 Independent living

IoT applications and services will have impact on independent living by detecting the activities of daily living using wearable and ambient sensors, monitoring social interactions using wearable and ambient sensors, monitoring chronic disease using wearable vital signs sensors, and in body sensors. Using Pattern detection and machine algorithms we can monitor patient health and take care of them.

3.5 Retail, logistics and supply chain management

IoT plays important role in retail and supply chain management (SCM) operations. RFID-equipped items and smart shelves track the present items in real time, a retailer can optimize many applications.Automatic checking of goods receipt, real time monitoring of stocks, and the detection of shoplifting can be done. IoT can help making the data from the retail store available for optimizing the logistics of the whole supply chain [16]. By exchanging of RFID data logistic processes from supply chains are benefited.

3.6 Manufacturing industry

Using embedded smart devices or through the use of unique identifiers and data carriers that can interact with an intelligent supporting network infrastructure and information systems, production processes can be optimized from production to disposal.Greater Transparency can be obtained for status of shop floor, location disposition and production machines by tagging items and containers. Self-organizing and intelligent manufacturing solutions can be designed around identifiable items [16].

3.7 Environment monitoring

Utilization of wireless identifiable devices in environmentally friendly programs worldwide will be increase in coming future.

ISSN (O) 2454-9665
ISSN (P) 2454-0663

3.8 Transportation industry

IoT offers solutions that provide security policies of the governments and the transportation industry for fare collection and toll systems, screening of passengers and bags boarding commercial carriers and even international cargo system .It helps in Monitoring traffic jams through cell phones of the users and deployment of intelligent transport systems (ITS). IoT technologies helps in managing passenger luggage in airports and airline operations will help in automated tracking and sorting and increased security.

3.9 Agriculture and breeding

IOT is useful for traceability of agricultural animals and their movement's example during outbreaks of contagious disease. Countries give subsidies to farms with cattle, sheep, and goats depending on the number of animals in a herd and other requirements. Therefore, the application of identification systems, animal diseases can be controlled, surveyed, and prevented. .Using Iot Blood and tissue specimens can be accurately identified also certification of the health status of herds, regions, and countries. With the Internet of Things, single farmers may be able to deliver the crops directly to the consumers in direct marketing or shops but also ina large area. This will change supply chain.

3.10 Media, entertainment industry

IoTtechnologies supports gatheringnews based on locations of the users to see multi-media-capable devices present at a certain location, and sending them a (financial) offer to collect multimedia footage about a certain event. Near field communication tags can be attached to posters for providing more information by connecting the reader to an URI address containing detail data.

3.11 Recycling

IoT and wireless technologies increase the effectiveness of numerous vital city and national environmental programs, including the monitoring of vehicle emissions to supervise air quality, the collection of recyclable materials, the reuse of packaging resources and electronic parts, and the disposal of electronic waste (RFID used to identify electronic subcomponents of PCs, mobile phones, and other consumer electronics products to increase the reuse of these parts and reduce e-waste).

IV CONCLUSION

Paper highlights on the important features and various aspects of IoT.Considering the current scenario and technology,IoT will beimplemented worldwide in coming future. For Large scale deployment of IoT in reality its important aspects need to be worked. In the area of governance of IoT there is urgent requirement of the development. Concept of combining computers, sensors, and networks to monitor and control devices is already there but the recent confluence of key technologies and market trends is emerging in a new reality for the "Internet of Things''. IoT willdefinitely bring the revolution and fully interconnect smart world with relationships between the objects and their environment. . In future, there will be intelligent applications for

ISSN (O) 2454-9665
ISSN (P) 2454-0663

smarter homes and offices, smarter transportation systems, smarter hospitals, smarter enterprises and factories using IoT .hence Internet of things might fundamentally change how the people think about what it means to be online and human life will be fully automated.

REFERENCES

1. D. Giusto, A. Iera, G. Morabito, L. Atzori (Eds.), The Internet of Things, Springer, 2010. ISBN: 978-1-4419-1673-0.

2. K. Ashton, That ―Internet of Things‖ Thing, RFiD Journal. (2009).

3. H. Sundmaeker, P. Guillemin, P. Friess, S. Woelfflé, Vision and challenges for realizing the Internet of Things, Cluster of European Research Projects on the Internet of Things - CERP IoT, 2010.

4. J. Buckley, ed., The Internet of Things: From RFID to the Next-Generation Pervasive Networked Systems, Auerbach Publications, New York, 2006.

5. E. Welbourne, L. Battle, G. Cole, K. Gould, K. Rector, S. Raymer, et al., Building the Internet of Things Using RFID The RFID Ecosystem Experience, IEEE Internet Computing 13 (2009) 48–55.

6. From the Internet of Computers to the Internet of Things FriedemannMattern and Christian Floerkemeier Distributed Systems Group, Institute for Pervasive Computing, ETH Zurich, Springer-Verlag Berlin, Heidelberg 2010 (242-259).

7. Ashton Kevin "That Internet of Things "Things in the real world things matter more than ideas,RFID Journal(2009).

8. Extracting Value From the Massively Connected World of 2015Online: www.gartner.com/DisplayDocument?id=476440.

9. R. Caceres, A. Friday, Unicom systems at 20: progress, opportunities, and Challenges, IEEE Pervasive Computing 11 (2012)

10. Internet of things – Converging Technologies for smart Environments and Integrated Ecosystems-OvidiuVermesan, Peter Friess,2013.

11. Analysys Mason, "Imagine an M2M world with 2.1 billion connected Things", online at http://www.analysysmason.com/aboutUs/news/insight/M2M_forecast_Jan2011/

12. E. Savitz, "Gartner: Top 10 Strategic Technology Trends For 2013" online at http://www.forbes.com/sites/ericsavitz/2012/10/23/gartner-top-10-strategic- technology-trends-for-2011

13. The Internet of Things: A survey Luigi Atzori a, Antonio Iera b, GiacomoMorabito,Elvisier(2010)

14. Internet of Things (IoT): A Vision, Architectural Elements, and Future Directions ,JayavardhanaGubbi,aRajkumarBuyya,b* SlavenMarusic,aMarimuthuPalaniswamia,Elvisier (2013).

15. The Internet of Things,How the Next Evolution of the Internet Is Changing Everything ,Dave Evans(2011), Cisco IBSG ,2011

16. DebasisBandyopadhyay, JaydipSen "Internet of Things: Applications and Challenges in Technology and Standardization" arXiv:1105.1693v1 [cs.CY] 9 May 2011