

Survey Paper: Internet of Things (IOT)

Ashish Jaiswal¹ & Raghvendra Kumar²

^{1,2}Dept. of Computer Science & Engineering, LNCT Group of College,
Jabalpur, MP, India

aashish.aj12@gmail.com, raghvendraagrawal7@gmail.com

Abstract – Internet of Things (IOT) has provided an opportunity to build powerful industrial system and applications by leveraging the growing ubiquity of RFID, wireless, mobile and sensor devices. Many industrial IOT applications have been increasingly developed and deployed in recent years. Now-a-days, controlling and monitoring plays a main role in our day to day life. Everything we can monitor and control using advanced technologies. Remote access is a wonderful feature that came because of high speed internet. The main objective of proposed system is to provide a technology oriented and low cost system to make an advanced industry for those who away from their industry and want to control devices.

Key Words: Internet of Things (IOT), Server, Raspberry Pi, Webpage, Ethernet, Smart phone etc.

INTRODUCTION

Earlier there was a simple manual way of handling machines. However, with the advancement of technology, new ways are introduced for controlling the machines like automation. At the touch of a button [1, 2], we can access large amount of information due to capability of computers and the Internet. Everybody wants an

affordable and secure way to control their machines from any smart mobile device or Internet connection. The Internet of Things (IoT) is the network of physical objects or "things" embedded with electronics, software, sensors and connectivity to enable it to achieve greater value and service by exchanging data with the manufacturer, operator or other connected devices. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure [3, 4].

Internet of Things is the next big revolution of the world on digitalization of commercializing various modules/products. Everything is associated with the internet, some involves controlling and some involves monitoring the parameters from anywhere. The Internet of Things is today's most trending technology that stands alongside wearable's and robotics [5, 6].

A printed circuit board (PCB) is the basic part in industry for manufacturing of any electronic product. Etching is main process for developing a PCB. In etching machine, the etchant solution is distributed

over the boards by nozzles and recalculated by pumps. Adjustment of the nozzle, temperature and etchant composition gives predictable control of etching rates and high production rate. Etching at ambient temperature might take over an hour, so it is better to heat up the etching solvent to about 35-45 degree celcius. At higher temperatures the etching performance decreases, so it is necessary to control the temperature of solvent. So the proposed system continuously monitors the Machine and at a specific condition it will take necessary action [7, 8].

IoT has the capacity to bring revolution in the field of internet and can change the shape and economic status of one's life. But, along with its enormous benefits it also faces many challenges which are needed to be handled and resolved carefully. Otherwise the result may be reversed of the expected outcome [9,10]. Some of the challenges could be described as follows:

- **Security:** Security is the major concern in the implementation of smart system. As, these systems include a lot of perception devices which are spread over a large area and it is necessary to restrict the intruders from the area in order to save the system

from any physical or operational damage [11].

- **Confidentiality:** This is another important parameter observed while discussing challenges of IoT. Various sensors that are implemented in the system are meant to gather data as per the need and their functionality and these data are transferred to the processing unit via some transmission system, now it is very much required to maintain the confidentiality of the data during its transmission [12].
- **Clean and Green IoT:** Due to the increase in the number of internet enabled devices the data rates requirement is also increased. This results in the high energy consumption. With the rapid growth of IoT this demand will also grow. So it is needed to develop energy efficient devices and to adopt green technologies in this field [13].

- **Interoperability:** In today's scenario most of the manufacturers develop the products that are compatible only with their own technologies and services which restricts them to use the platform of their choice. So, while working with IoT it is necessary to focus on the interoperability of the devices [14].
- **Identity:** It is predicted that by next 5 years around billions of object will be connect together to provide innovative services, so the unique identification of each devices and tags are very much required in this field in order to overcome from the conflicts.
- **User Friendliness:** The applications that are being developed with the use of IoT is needed to be user friendly in order to use them in real time. As we know that IoT uses so many devices and technologies for the operation. But the

product developed after its implementation must be friendly one that could be easily operated by a Lay man.

LITERATURE SURVEY

Li Da Xu, Wu He, and Shancang Li [1]: This paper reviews the current research of IoT, key enabling technologies, major IoT applications in industries, and identifies research trends and challenges. A main contribution of this review paper is that it summarizes the current state-of-the-art IoT in industries systematically.

AlaaAlhamoud, Felix Ruettinger, Andreas Reinhardt, Frank Englert, Daniel Burgstahler, Doreen Bohnstedt, Christian Gottron and Ralf Steinmetz [2]: This paper presents framework for realizing energy efficient smart homes based on wireless sensor networks and human activity detection. Their work is based on the idea that most of the user activities at home are related to a set of electrical appliances which are necessary to perform these activities.

Therefore, they show how it is possible to detect the user's current activity by monitoring his fine-grained appliance level energy consumption. This relation between activities and electrical appliances makes it possible to detect appliances which could be wasting energy at home. Our framework is organized in two components. On one hand, the activity detection framework which is responsible

for detecting the user's current activity based on his energy consumption.

Kemal Akkaya, Ismail Guvenc, Ramazan Aygun, Nezh Pala and Abdullah Kadri [3]: This paper surveys the existing works on occupancy monitoring and multi-modal data fusion techniques for smart commercial buildings. The goal is to lay down a framework for future research to exploit the spatio-temporal data obtained from one or more of various IoT devices such as temperature sensors, surveillance cameras, and RFID tags that may be already in use in the buildings.

Andrea Zanella, Nicola Bui, Angelo Castellani, Lorenzo Vangelista, and Michele Zorzi [4]: This paper focuses specifically to an urban IoT system that, while still being quite a broad category, are characterized by their specific application domain. Urban IoTs, in fact, are designed to support the Smart City vision. This aims at exploiting the most advanced communication technologies to support added-value services for the administration of the city and for the citizens. This paper hence provides a comprehensive survey of the enabling technologies, protocols, and architecture for an urban IoT.

Ala Al-Fuqaha, Mohsen Guizani, Mehdi Mohammadi, Mohammed Aledhari, and Moussa Ayyash [5]: This paper provides an overview of the Internet of Things (IoT) with emphasis on enabling technologies, protocols, and application issues. The IoT is enabled by the latest developments in RFID, smart sensors,

communication technologies, and Internet protocols. The basic premise is to have smart sensors collaborate directly without human

involvement to deliver a new class of applications.

The current revolution in Internet, mobile, and machine-to machine (M2M) technologies can be seen as the first phase of the IoT. In the coming years, the IoT is expected to bridge

diverse technologies to enable new applications by connecting physical objects together in support of intelligent decision making. This paper provides a horizontal overview of the IoT. Then give an overview of some technical details that pertain to the IoT enabling technologies, protocols, and applications. Compared to other survey papers in the field, our objective is to provide a more thorough summary of the most relevant protocols and application issues.

CONCLUSION

The monitoring and controlling of machines in industry has become a major problem. By surveying all above reference papers most of the work done related to home automation. The proposed system take few parameters related to industry and provide facility related to that .The proposed system enables us to monitor and control machines from remote places as well as gives information regarding the maintenance. This kind of system useful because Human can make mistakes and forgot to switch off the machine at specific condition.

REFERENCES

- [1] Li Da Xu, Wu He, and Shancang Li, "Internet of Things in Industries: A Survey" IEEE transactions on industrial informatics, vol. 10, no. 4, November 2014.
- [2] Alaa Alhamoud, Felix Ruettinger, Andreas Reinhardt, Frank Englert, Daniel Burgstahler, Doreen Bohnstedt, Christian Gottron and Ralf Steinmetz, "SMARTENERGY.KOM: An Intelligent System for Energy Saving in Smart Home", 3rd IEEE international workshop on global trends 2014.
- [3] Kemal Akkaya, Ismail Guvenc, Ramazan Aygun, Nezhir Pala, Abdullah Kadri, "IOT-based Occupancy Monitoring Techniques for Energy-Efficient Smart Buildings", 2015 IEEE wireless communication and networking conference.
- [4] Andrea Zanella, Nicola Bui, Angelo Castellani, Lorenzo Vangelista, and Michele Zorzi, "Internet of Things for Smart Cities" IEEE Internet of things journal, Vol. 1, No. 1, FEBRUARY 2014.
- [5] Ala Al-Fuqaha, Mohsen Guizani, Mehdi Mohammadi, Mohammed Aledhari, and Moussa Ayyash, "Internet of Things: A Survey on Enabling Technologies, Protocols, and Applications", IEEE communication surveys & tutorials, vol. 17, no. 4, fourth quarter 2015.
- [6] Nagender Kumar Suryadevara, Subhas Chandra Mukhopadhyay, Sean Dieter Tebbe Kelly, and Satinder Pal Singh Gill, "WSN-Based Smart Sensors and Actuator for Power Management in Intelligent Buildings" IEEE/ASME transactions on mechatronics, vol. 20, no. 2, april 2015.
- [7] Dan D. Koo, John J. Lee, Aleksei Sebastiani, and Jonghoon Kim, "An Internet-of-Things (IoT) system development and implementation for bathroom safety enhancement" International Conference on Sustainable Design, Engineering and Construction, Sciencedirect Procedia Engineering 145 (2016) 396 – 403.
- [8] Vinay M, Shivashankar s k, "Monitoring And Controlling Of Smart Equipments In Manufacturing Industry Using Iot Applications", International Journal of Technical Research and Applications e-ISSN: 2320-8163, www.ijtra.com Volume 4, Issue 3 (May-June, 2016), PP. 96-100.
- [9] M.Zorzi, A.Gluhak, S. Lange, A. Bassi, "From today's INTRANet of things to a future INTERNet of things: a wireless-and mobility-related view", IEEE Wireless Communications, 2010, Vol.17, Issue.6, pp.44-51.
- [10]. A.Sehgal, V. Perelman, S. Kuryla, J. Schonwalder, "Management of resource constrained devices in the internet of things", IEEE Communications Magazine, 2012, Vol.50, Issue.12, pp.144-149.
- [11]. S. Helal, W. Mann, H. El-Zabadani, J. King, Y. Kaddoura, and E. Jansen, "The gator tech smart house: A programmable pervasive space", IEEE Computer, Vol. 38, Issue.3, 2005, pp.50-60.

[12]. D.J.Cook, “Learning Setting- Generalized Activity Models for Smart Spaces”, IEEE Intelligent Systems, Vol. 27, Issue. 1, doi: 10.1109/MIS.2010.112, 2012, pp. 32 – 38.

[13]. F. Doctor, H. Hagra, V. Callaghan, “A fuzzy embedded agentbased approach for realizing ambient intelligence in intelligent inhabited environments”, IEEE Transactions on Systems, Man and Cybernetics, Part A: Systems and Humans, Vol.35, Issue.1, 2005, pp.55-65.

[14]. J. A. Kientz, S. N. Patel, B. Jones, E. Price, E. D. Myant, G. D. Abowd, “The Georgia Tech aware home”, Proceedings of the Extended Abstracts on Human Factors in Computing Systems, doi:10.1145/1358628.1358911, 2008, pp. 3675-3680.