Chapter 8

IOTs:
An Enabler for Human and Business Activities

N. Raghavendra Rao
FINAIT Consultancy Services, India

ABSTRACT

Information technology has advanced by delivering an exponential increase in computing power. Telecommunication technology has likewise advanced communicating capabilities. Convergence of these two technologies has become possible due to the rapid advancements made in the respective technology. This convergence is termed as information and communication technology as a discipline. Many concepts are emerging in this discipline. These concepts enable business, government, and human beings to reach new realities in their required activities. Some of these concepts have created various opportunities for designing and manufacturing electronic devices. When these devices are connected to other devices and systems over the internet, this is now known as internet of things (IoT). This chapter gives a brief overview of the concepts such as cloud computing and ubiquitous and pervasive computing in the context of internet of things. Further, this chapter discusses five case illustrations with the relevance of internet of things.

INTRODUCTION

In the early years, the internet was mainly used by military and research institutions in the United States of America. Now it is being used across the globe in every activity under the sun. People prefer to be on the internet. One of the main reasons, it is simple to use. The internet is a good example of functional freedom. In principle any node can speak as a peer to any other node as long it obeys the rules of the TCP/IP protocols, which are strictly technical, not social or political. The Internet can be compared to a human language. Nether none hires a language nor no one owns a language. It is up to an individual to learn and to speak a language. People consider the internet as similar to a language. It belongs to everyone.

Ubiquitous and pervasive computing concepts have facilitated many manufacturers to design and develop electronic devices. Consequent to the advancements in the "Internet" many electronic devices are embedded with a feature of the "Internet". When these devices are connected to other devices and systems over the internet, are referred to as the "Internet of Things" (Daniel Kellmerit, & Daniel Obodovski, 2013)

The importance of the "Internet of Things" is that data collected and analyzed to provide insights or actions. Integration of that data depends upon the management and security of the whole system related to that data. The choice of connectivity protocol plays an important role in the "Internet of Things" (Frank Dushlmann, Jim Moorish, & Rishi M Bhatnagar, 2016).

The important requirements such as sustainability and reliability in transmitting data over distances to heterogeneous devices need the attention of the developers of the system. The efficiency of the above requirements is important because of battery-operated sensors or electrically operated sensors embedded in stationary and moving objects.

Application updates, security patches, remotely managing the operations, and maintain ace of various devices require massive scalability and flexibility. The concept of cloud computing facilitates handling the above requirements. Robust and scalable architecture is available in private and public cloud environments.

BACKGROUND

It is a general practice business model developed under information systems that follow two methods. They are "push" and "pull" methods. When information is thrust on end-users, it is considered as a "push method". The classic examples for this method are advertisements (print and electronic media), telemarketing, and information through email and snail-mail. End users when they browse websites and go through hard copies for specific information can be termed as "pull method". It has been the practice among end-users to understand the information provided under the above methods and relate to a particular context. This means end-users are proactive in the context of computing. Now attempts are being made to make the information systems proactive to the context. Now the trend is developing context-aware applications. The word "context" has its origin in the Latin verb "contexture". It means to weave together. This meaning has more relevance in context computing. The main feature in context computing is the ability to sense and process information as per the requirements of end-users. It relates to a particular context relevant to end-users. There are many definitions in respect of "context comput-ing". They fall under two categories as "Enumeration Based" and "Role-Based". The former category talks about context in terms of its various categorization. The second category is very specific in terms of its role in context-aware computing. The essence of all the various definitions can be classified un-der five categories. They are (1) computing context consists of network, connectivity, communication bandwidth, and local resources. (2) User context considers profile, location, and people in the vicinity of the user. (3) Physical context includes lighting and noise levels, traffic conditions, and temperature (4) temporal context talks about the time of day, week, month, and season of the year. (5) Context history is the recording of computing, user, and physical context across the period. Further, they define context under "role-based" as the set of environmental status and settings. This either determines and application behavior or in which an application event occurs. It is interesting to the user. It can be inferred from the essence of the definitions that context-aware computing applications are developed to respond to changes in the environment in an intelligent way for the benefit of end-users. Ubiquitous and pervasive computing

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