

Applications of Internet of Things in Human Life

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Abstract - Human race is entering into a world of Internet of things (IoT) where devices in the network communicate and share data to make our life simpler and faster. This paper is discussion on IoT, review of applications of IoT where we can manage our home, health care, travel, shopping and offices.

Key Words: IoT; Applications of IoT; study of IoT

1. INTRODUCTION

Internet of Things (IoT) is network of physical objects or “things” embedded with electronics, software, sensors connected in a network to enable data communication, collection and exchange within the network. IoT allows objects to be sensed, monitor and controlled remotely in the existing infrastructure of the network.

In an IoT environment things or devices make themselves recognizable and obtain intelligence by enabling self to take decisions based on information they communicate and share among themselves. The sensors play very vital role in collecting the information from the physical or virtual world in analog or digital form and fetches it to IoT platform for further processing and storage on cloud. Then, the processed data is given to the actuator in the physical world for controlling the device or things. The processed data can also be analyzed in the form of graph for real time monitoring.

2. LITERATURE SURVEY

The researchers are still facing difficulties in applications of Internet of Things (IoT) secure and safe communication in network of IoT.

Authors presented applications in the Internet of Things (IoT), which was divided into factors such as what is the IoT, innovation and applications of IoT and future Internet technologies. Authors discussed applications mostly used such as smart cities, smart energy and electric grid, smart buildings, homes and Infrastructure. They mentioned that there is need to take into the consideration about challenges involved. They described that some applications have challenges such as institutional, engineering, science and economical. The authors had studied about applications in the Internet of Things, factors affecting sensors and electronics applications in the Internet of Things, and challenges and solutions for emerging sensors and electronics applications in the Internet of Things. [1]

Authors focused on European economies. The authors identified applications which had impact and critical technologies related to European economies which included innovative materials, photonics, advanced engineering systems, and biotechnology [2]

Authors described about the need for cross domain IoT applications and services. It also focused on various prospects those are available in IoT and challenges those need to be taken into consideration. The paper described about current situation of IoT landscape. Authors of this paper presented an approach called H2020 symbIoTe project. This project enables cooperation between platforms and application developers to develop innovative and cross domain applications. [3]

The authors described about complexity which occurs when the number of various devices such as sensors, actuators and other IoT devices increases. They had looked into problems and elaborated on IoT Management Platform (IoT-MP). They looked into problems such as maintenance and control, performance, security and privacy. This platform offered management functions which were necessary for monitoring, control and communication. They conducted an experiment on smart home application based on this IoT-MP. They described advantages about this application. They did not take into consideration IoT-MP for Location Privacy Management model. Also, they did not implement management capabilities needed for managing security and privacy of devices in IoT. [4]

3. CONCEPTUAL DESIGN

Conceptual diagram of Internet of Things consist of hardware parts such as peripheral hardware, embedded system, local network and of course high-speed Internet connectivity.

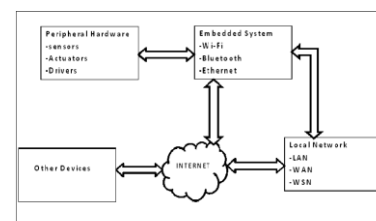


Fig.1. Conceptual diagram of IoT

Let us consider an application of Internet of Things (IoT) where we need to control the washing time of utensils and cook wares in the dish washers from a remote location. The

run time can be set by the user to operate the driver circuit of the motor which will run the dishwasher.

4. APPLICATION

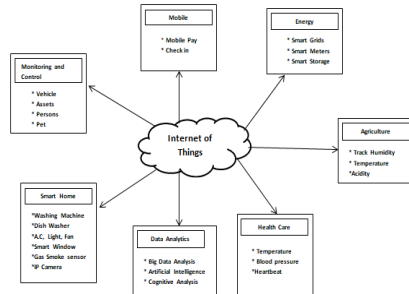


Fig.2. Applications of IoT

Internet of Things covers wide range of application domains which includes Energy, Data Analysis, Agriculture, Health Care etc. as shown in Fig 2.

A. Smart Grid

To meet the demand for electricity in 21st century by many of the developing countries like India, China, Brazil the IoT based Smart grid technology can play a significant role. A smart Grid is based on developing a network of transmission lines, equipment, controls and new technologies working in a smart network to respond immediately to the real time energy need. A smart grid introduces a two-way dialog where electricity and information can be exchanged between the utility and the customers. The Smart Grid enables newer technologies to be integrated like wind, solar and nuclear energy to make it more efficient and greener.

B. Data Analysis

Data Analysis is one of the most exciting domains in emerging field of IoT that involves video data, sensor data, social media data etc. To extract meaningful conclusion out of the big and small data sets with varying data properties. The use of MATLAB to analyze IoT sensor data and using conceptual learning method like machine learning algorithm can improve their performance as we increase the number of samples available for learning.

C. Agriculture

Use of IoT can be used to improve farming techniques leading to better and increases crop production by providing farmers with information about soil, nutrition, rainfall, pest infection, crop s, fields etc. In Smart farming, a system is built with the use of sensors to keep a check on light, humidity, temperature, soil moisture etc. and automating the irrigation system from anywhere in the world.

D. Health Care

IoT application in health care sector provides a latest technology tool to doctors worldwide to remotely monitor elderly patients, chronically ill as well as patients struggling immobility issues. Smart watches, fitness bands have sensors for collecting the vital information like blood pressure etc. For real time monitoring, providing feedback and linking there data to medical professionals.

5. CONCLUSION

Human beings are surrounded by the devices involved in Internet of Things. Even though there are various applications of IoT in our daily routine life, challenges associated with these applications should also be taken into consideration. This paper explores about Internet of Things, the study of prior work done in the area of IoT and applications of Internet of Things. Along with the applications paper consist of challenges involved in these applications which were mentioned by researchers earlier. The paper has looked into limited number of applications which can be further expanded.

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