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A REVIEW PAPER ON INTERNET OF THINGS (IOT)

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ABSTRACT In today's world of advance technology, we are coming across various new paradigms of technology. IoT is one of the most talked about among them in the industry. Internet of Things is influencing our lifestyle and is becoming fastest growing technology. IoT provide infrastructure for real time objects and also help in keeping track about these objects. In IoT devices are connected smartly so that they can share data, resources with other machines. IoT uses various types of sensors embedded in various devices which emit data. These sensors share data using IoT common platform. These platforms collects data from various sources and then further analytics are performed on data and essential information is extracted finally the result is shared. This research article comprises of meaning of IoT, characteristics, basic requirements of IOT and its applications. The main objective of this paper is to provide overview of the evolution and usage of Internet of Things (IoT), its architectures and benefits as well as disadvantages.

KEYWORDS : Internet of things, sensors, Architecture, smart devices, Radio frequency identification, web services

INTRODUCTION

Internet of Things (IoT) is the buzz word in all academic and industry quarters of sciences and technology. In general sense, it represents the capacity of network devices to logically sense and systematically collect data from various sources around the world and then share this data across internet[1].Then the shared data is further processed and utilized for other useful purposes. The IoT is a gamut of smart machines communicating with other smart machines, objects, environments and infrastructures. In today's modern digital world each individual is connected with every other individual using sundry connecting and communication devices, wherein the most popular mode of communication is Internet. Therefore it is the internet that connects people around the world and thus IoT [2] becomes the focus for deriving the underlining behaviours, information, trends as well as patterns through the usage of internet. The basic idea of IoT has prevailed from around two decades. It has attracted many academicians, researchers as well as industrialists because of its huge impact in improving the daily life and society. When things like smart household appliances are connected to a network they get improvised to provide ideal service as a whole. Some mundane things which is possible with IoT is a smart residence with automatic windows that can be opened and closed and respond when the gas burner is turned on by automatically opening. The air Conditioner can be switched from the car and lights could be controlled by using internet. This kind of an environment is especially more useful for persons with disability and moreover the ultimate arrangement of devices as a system instead of individual units.

The theoretical basis of network of smart devices was first applied in 1982 to a coke vending machine at Carneige Mellon University as the first digital appliance reporting its stock of bottles and the temperature condition of the drinks. After reading various sources ,it was found that the book "The Computera of the 21st Century" written by Mark Weiser in 1991 as well as Academic quarters like Ubicomp and Percom designed a contemporary vision of IoT. Reza Raji, a researcher in 1994, described the concept of IEEE Spectrum as "moving small packets of data to a large set of nodes to integrate and automate everything from home appliances to entire factories." From 1993 to 1997, several companies like Microsoft at Work (MaW) and Novell's proposed solutions based on a similar platform. MaW was a small project promoted by Microsoft to bring together common business machinery, like fax machines and photocopiers, using a common communications protocol permitting control and status information to be pooled with computers running Microsoft Windows. The idea gained popularity when Bill Joy envisaged D2D (Device to Device) communication at the World Economic Forum at Davos, Switzerland in 1999[3].

Manpower requirements are urgent in every organization for the information desk to each and every department. To provide information, advertisements, messages and other notifications for the customers and the staff the information desk plays a crucial part. Due to IoT this function and manpower role has been cut down and replaced by smart devices. This has been a major achievement especially in cost cutting, updating of information for prompt services and better and efficient utilization of resources.

LITERATURE SURVEY:

Kevin Ashton, a British technological pioneer coined the term 'Internet of Things' to support the idea of supply chain management in 1999. However, in the past few years the term has become more comprehensive and now includes wider spectrum of services like Healthcare, Transport, Utilities, Consumer goods etc[4]. The connotation of the word "Things" has changed due to changes in technology but the purpose and goal of computer sensing information without any human aid has remained the same though.

Some technologies that supplements and promotes 'Internet of Things' are:

i. Near-field communication and Radio Frequency Identification (RFID) - Near Field Communication short range connectivity protocol that enable communication between two devices during 2010 NFC became more popular on the other hand In the 2000s, RFID technology uses radio waves to spot the objects.
ii. Quick response codes and Optical tags - QR code consist of data. This is low cost tagging technique. Phone cameras decipher QR code using image processing techniques.
iii. Bluetooth and low energy - This is the latest high speed, low powered wireless technology which is designed to unite smart devices or gadgets with other portable apparatus together.

The authors in [5] describes the concept of Internet of things along with the architecture of IoT, protocols to develop IoT Architecture and challenges for developing Intelligent system for real time environment. The authors [6] describes smart urban Ecosystem which includes smart cities environment ,applications and infrastructure .Integration of cyber and physical component to control and monitor urban environment. In literature present in [7] describes the concept of automatic smart parking system by using IoT. Smart parking will be using cloud services for storing information about various vehicles along with their IN-OUT time, number of parking slot, number of parking slots available. Components for smart parking will include Raspberry Pi, Camera, IR sensors, Display device, User device etc

In [8] the author describes the IoT along with new paradigms like fog

computing and edge computing.fog computing is decentralized computing infrastructure which means processing is done closer to the node where data is created[9].IoT technology has great potential; it can help in cost reduction and supports new business models. IoT is channelling itself in all the developed and emerging markets globally. Companies like Samsung, LG, Qualcomm, Intel etc. The Industrial Internet of Things (IIoT) market is predicted to reach $123B in 2021 reach a CAGR of 7.3% by 2020.Top 3 IoT projects in progress are Smart Cities (23%), Connected Industry (17%) and Connected Buildings (12%) according to Forbes 2018 report. Various IoT analytics have set up half of smart cities projects in Europe with 45% in America and 55% of global projects[10].

Major advantages of this technology:

- Access Information - data can be accessed from remote locations.
- Communication - effective communication is possible via connected devices.
- Automation - task done without human intervention.
- Major disadvantages of this technology:
- Complexity- A diverse devices connected to a network single loophole can affect entire network.
- Privacy/Security - In today's tech world where all the devices are connected to internet, Loss of data is possible
- Loss of Jobs - automation leads to loss of jobs

Applications of IoT:

As Internet of Things (IoT) in 2019 is ready to rule world, its cost efficient feature has enabled new business models. There are various areas where IoT is being used. Some of them are listed below:

- Smart Home
- Smart Cities
- Wearable's
- Connected Cars
- Industrial Internet
- IoT in agriculture
- Smart Retail
- Energy Engagement
- IoT in Healthcare
- IoT in Poultry andFarming
- Ground water detection and water reservation.

FUTURE OF IOT:

The future for IOT is very scalable and bright. Most of the developed countries are investing billion dollars to convert the existing infrastructure in Smart Infrastructure. The Industrial Internet of Things (IIoT) market is predicted to reach $123B in 2021, attaining a CAGR of 7.3% through 2020 according to a recent Forrester survey of 2018.The following figures show the year on rise of the use of Industrial IoT worldwide as predicted by state of the art analytics software Statistica.

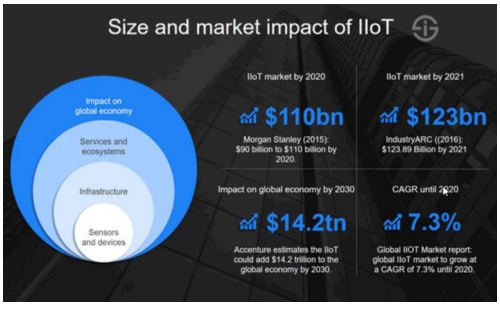

Figure 1 Size an Market impact of IIoT

Source: The Industrial Internet Of Things (iiot): The Business Guide To Industrial Iot

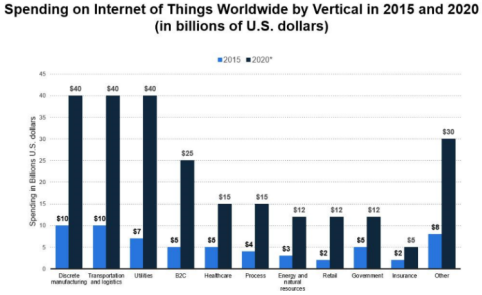

Figure 2 Spending on IoT

Source: Statista.

CONCLUSIONS

IoT promises of an improved quality of human life and productivity of enterprises. It has the potential to enable extension and advancements of fundamental services in health care, transportation, logistics, security, education through widely distributed and locally intelligent networks of smart devices and robust ecosystem of application development. Although, substantial efforts are required to mobilize the industry to move beyond the early stages of market development towards market maturity by unleashing the hidden opportunity offered by IoT. The market can place differing demands on the mobile networks with regard to service distribution, customer-charging model and capacity to deliver IoT services etc. which can pose a challenge to the mobile service providers. The pieces of technology puzzle are coming together to welcome IoT sooner than most conservatives expect. Just as it was not very long ago the internet became a household name within few years and www became a necessity, the Internet of Things will also touch every aspect of human life sooner than we can imaginey.

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