Contribution of Internet of Things: A Survey

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Abstract
Internet of Things plays an important role in our day to day life activities by engaging ourselves in implementing various technology Enabled embedded smart devices for our daily use. In this paper, we have discussed about the application uses of Iot along with other subject areas namely, Iot with cloud computing, big data, Internet of computer, data mining, embedded security, challenges in IOT-MD and Social impact of IOT. IOT together with subject area provides good enhancement by making things easier.

Keywords: IOT, IOT-MD, smart devices, WSN, RFID

INTRODUCTION

Internet of Things plays an important role in our day to day life activities by engaging ourselves in various technology embedded smart devices. IOT helps in avoiding the occurrence of problems by making our human life simpler, smarter, integrated in by making things easier. Inside a network, IOT is used with various combination of protocol, to improve effectiveness of user request, good responsiveness, efficiency, low power consumption, longer bandwidth and robust in bidirectional communication for long range [1–7]. The availability of sensors to detect temperature, motion, humidity, light, glass breakage enables a powerful mesh network that extends the capabilities of all devices connected to it. Also, with the help of these sensors our real time application will provide good outcome. In fact, the IOT can provide significant benefit to industrial automation, lighting control, home/building automation, security and monitoring, health and fitness and agricultural applications [8–14].
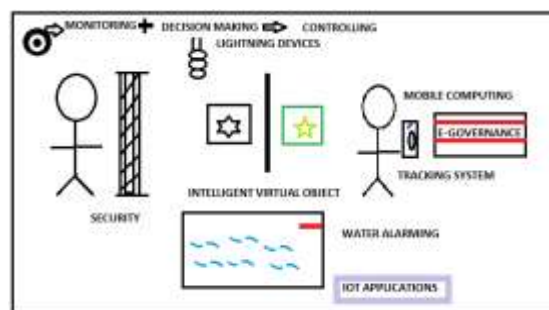

Fig. 1: Applications of IOT.

IOT makes devices to use it best time under certain condition. A device can wait and perform its activities under low electricity for long time with good effectiveness [15–22]. In Silicon Valley laboratories they mentioned the usage of IOT in two types namely proactive usage and proactive maintenance. In proactive usage IOT can be appended with various devices to make smart devices. Lightning devices actions like switch on the light when the person is in house, switch off the light when he is in outer. In proactive maintenance with various sensors integration IOT can be projected in alarming, security, monitoring, controlling etc. [23– 30].

Gartner indicates the market for Internet of Things devices is poised to explode and will reach nearly 21 billion connected devices by 2020 [31–35]. For IOT is 20.8 billion. Iot provides support to the services in marketing and also provide its services for outsider request to design, built, manage and control IOT with regards to the Gartner. Thus, IOT makes 22% of increment for these sevices. "IoT services are the real driver of value in IoT, and increasing attention is being focused on new services by end-user organizations and vendors [35]. At the enterprise level, Gartner separated connected things into two categories, including generic or cross-industry devices that are used in multiple industries, and vertical-specific devices that are found in particular industries [35].

Cross-industry devices include connected light bulbs; heating, ventilation, and air conditioning (HVAC) systems; and building management systems that are mainly deployed for purposes of cost-saving [35].

Vertical-specific devices, such as specialized equipment used in hospital operating theaters or field-based infrastructure projects, tracking devices in container ships and on airplanes, and others [35].
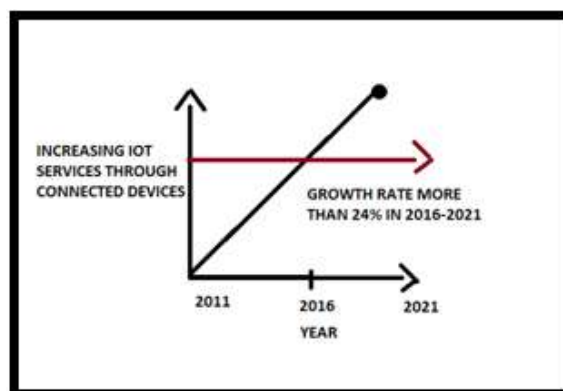

Fig. 2: *Growth Rate of IOT.*

Internet users across the globe totaled 3.14 billion in 2015, and that is estimated to surpass 3.29 billion by 2016 [22].

LITERATURE SURVEY

Applications of IOT
IOT helps in decision-making and productivity in manufacturing, retail, agriculture and other sectors. IOT introduces Machine to Machine (M2M) solutions - a subset of the IOT – already use wireless networks to connect devices to each other and the Internet, with minimal direct human intervention, to deliver services that meet the needs of a wide range of industries [2]. In 2011 Cisco international business group brought out a deal of imparting IOT in educational sector, business communication, applicational sciences, e-government, governance etc. [8]. IOT concentrates in

utilizing the data distribution in main functional areas. In order to build this gap minute sensors are implemented. To educate rural villages with a plain and simple terms IOT potential is used. According to the Cisco Internet Business Solutions Group (IBSG), IOT is simply the point in time when more "things or objects" were connected to the Internet than people [3].

A Study on Internet of Things based Applications given by Deeksha Jain, P. Venkata Krishna and V. Saritha. Deals with detailed analysis of various application based IOTs. Explains about how internet of things evolved from mobile computing and ubiquitous Computing [11]. The properties of Internet of Things (IOT) are product information, electronic tag, standard expressed and uploading information. It utilises the Radio Frequency Identification (RFID) technology and wireless sensor networks (WSN). IOT applications are used in domains such as healthcare, supply chain management, defence, agriculture and issues of IOT.

Somayya Madakam, R. Ramaswamy, Siddharth Tripathi given idea in transforming the real world objects into intelligent virtual objects. To unify everything in our world under a common infrastructure, giving us not only controls of things around us, but also keeping us informed of the state of the things [14]. The focus is concentrated in definitions, geneses, basic requirements, characteristics and aliases of Internet of Things [14].

Stephan Haller gave a clean idea in dealing with clarity in describing the most important terms like things, devices, entities of interest, resources, addressing, identity and, more importantly, the relationships between them [16].

Internet of Computers to the Internet of Things

Friedemann and Christian Floerkemeier have given an idea in vision, facing problems, overcoming challenges in technical aspects of internet of things. Mainly they focused on RFID, development in technological aspects of IP stacks and web server in day to day life objects. It also concludes issues in governance and social aspects in order to raise vision for IOT [5].

Types of IOT
The International telecommunications Union (ITU) has pointed out four dimensions of IOT : object identification (" tagging things") , sensors and wireless sensor networks ("feeling things"), embedded systems ("thinking things") and nanotechnology ("shrinking things'), IOT changes the connectivity view from "any-time , anyplace" for "any-one" into "any-time , any-place" for "any-thing" [11]. The main motive of Internet Of things is to make the things or objects in the world to be connected through internet, wireless sensor networks (WSN) and smart phones so that they can share information automatically [6]. Just like people sharing information. To implement this motive, there are many technologies that come into picture. Radio Frequency Identification (RFID) tags mobile phones, sensors, actuators, embedded systems and nanotechnology helps the things to communicate among themselves [11].

Data Mining with Internet of Things
Chun-Wei Tsai, Chin-Feng Lai, Ming-Chao Chiang, and Laurence T. Yang proposed an idea on connecting thing on earth via

internet through IOT. Data mining will no doubt play a critical role in making this kind of system smart enough to provide more convenient services and environments [17]. Datas captured by IOT are considered having highly useful and valuable information.

Integration of Cloud Computing with Internet of Things

Alessio Botta, Walter de Donato, Valerio Persico, Antonio Pescape given idea in combination of cloud computing with IOT. A survey on cloud computing along with IOT is discussed. Internet of Things with Robotics Cristina Turcu, Cornel Turcu, Vasile proposed an idea in IOT with robotics. Initially IOT developed as a tool, nowadays a robot can be integrated as an entity in the Internet of Things (IOT) [19]. IOT's infrastructure enables connections between different entities (living or non-living), using different but interoperable communication protocols [19].

Embedded Security for Internet of Things

Discusses the issues in network security, With the help of embedded system security provides solution for identifying temper proofing of the embedded security by the concept of trusted security, it deals with the issue of security of data at rest [21]. Requirements of embedded security along with the solutions for different types of attack are discussed.

Addressing Emerging Challenges in IOT-MD

Initially, aggregation devices are installed and located at the site, dedicated device gateways, home routers, smart phones and PCs, and their network is often referred to as

the Peripheral Area Network (PAN) [28]. By implementing PAN network challenges in IOT is discussed.

Social-Driven Internet of Connected Objects

Paulo Mendes seen a communications infrastructure to support the integration of a myriad of embedded and personal wireless objects [31]. The Societal Impact of the Internet of Things Societal Impact of the IOT This data-sharing assumption might lead to the IOT having even more dramatic impacts on privacy and data protection than other Information and Communication Technologies (ICTs) [34]. E.g., Water alarming for smart home network.

CONCLUSION

As we discussed IOT brings work morebuseful and fruitful for our daily lifes. Iot combined with cloud computing, big data, embedded application, medical sectors, various smart devices, data mining and for social driven Approach is considered. Increasing iot applicating will make services more done with good efficiancy. It improves network performance by collecting good data. In future the iot with various protocol combination can be used to access for a set N user with good efficiency. Zigbee protocol with iot will bring huge changes in communicational sector.

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