An atomization of Internet of Things

Prof Aruna Varanasi\(^1\), Rutwik V Jangam\(^2\), D Vishal Reddy\(^3\)

\(^1\) Professor, Head of department, Department of Computer Science and Engineering, Sreenidhi Institute of Science and Technology
Yammampet, Ghatkesar, Rangareddy-501301, India

\(^2\) Student, Department of Computer Science and Engineering, Sreenidhi Institute of Science and Technology
Yammampet, Ghatkesar, Rangareddy-501301, India

\(^3\) Student, Department of Computer Science and Engineering, Sreenidhi Institute of Science and Technology
Yammampet, Ghatkesar, Rangareddy-501301, India

Abstract:
The issue of using different control devices with different switches leads to a lot inconvenience. This can be further simplified by using the upcoming technology known as Internet of Things. This helps in accessing all the electronic devices in a single go. Though the “Internet of Things” seems pretty simple in theory but, coming to implementation, it is very diversified and complex in nature. This first part of the paper is the brief explanation of Internet of Things and later part reviews the implementation of Internet of Things. This upcoming technology would make the individual’s life easy. This paper also covers various applications of this technology and the future aspects related to Internet of Things.

Keywords: Internet of Things, IOT, Future, Environment.

I. INTRODUCTION

The Internet of Things includes embedding digital behavior into everyday objects and giving them network technology and also digital presence. The internet of things is concept of connecting all the physical and human usable elements present in the world through internet medium. All the gadgets will be made connected with each other and one device is made as a remote to all other device i.e. all the devices can be controlled with only that remote device. In an elegant way the internet of things can be described as ‘The layer of physical information that covers the physical world’. The Internet of things for manufacturers is like a world changing wave. In The Internet of things uses an universal protocol to combine and communicate with the several heterogeneous devices as shown in fig.1. All the devices that are actively participating in The internet of things are enabled to communicate and interact among themselves and also with the environment by exchanging the information and the data sensed about the environment and influencing it by running processes that trigger the actions made and create services with and without human intervention.

Fig.1. connection of heterogeneous devices
II. ORIGIN

The perception of a network of smart devices was openly discussed in the early 1980’s, with a custom-made Coke machine at Carnegie Mellon University fetching the earliest internet-connected electrical device, which had the ability to tell if the drinks that were most recently loaded were cold or not. The contemporary visions of IOT were produced in many academic venues by then through various papers and researches. Reza Raji in 1994, explained the notion of IEEE Spectrum as stirring small packets of data to a bulky set of nodes, so as to incorporate and computerize the whole lot from residence appliances to intact factories. The field started gathering momentum only in the late 1990’s.

The conception of the Internet of Things initially became well-liked in 1999, via the Auto-ID hub at MIT and its related publications. Radio frequency identification or the RFID was then known by Kevin Ashton who was one of the founders of the Auto-ID hub as a precondition for the Internet of Things. If identifiers were given to the entire object and the people in daily life, they could be easily managed by the computer systems. Other than using the radio frequency identification, the labeling of things could be achieved all the way through such technologies as NFC or communication, QR codes, barcodes and digital watermarking.

Direct and perpetual inventory power would turn out to be omnipresent. Transformation of daily life would be one of the foremost consequences of implementing the Internet of Things by associating all objects in the world with microscopic identifying devices or system-acceptable identifiers, in its innovative elucidation.

As we have known the internet of thing from past decade, much advancement has been happening in the present era of technological world in the field of internet of things. Let us start with:

1. A computer that has been developed by the Intel which is of size of a small SD card. This personal computer is powered by a dual core Quark SOC, and runs Linux operation system and also has built in Wi-Fi and Bluetooth connectivity which are the two main ways on which the connection of many different objects is based in the concept of internet of things.

2. There are many experiments being conducted on the development on the smart cities and an example to this is the smart city of Songdo. This is the world’s first “city in the box. It is located in South Korea, 40 miles away from Seoul and 7 miles away from Inch eon international airport. This will soon become a fully connected city. This development is being done by consortium of partners consisting of Cisco, 3M, Posco E&C and United technology. The development started in 2000 with a cost of $35 billion and every inch of the city is wired with fiber optic broadband [1][2].

3. The year 2005 is the beginning of the connected home.

   a. LIGHT SWITCH: A simple way in which the lights are switched on and off with the other devices.
   b. SMART REFRIGIRATOR: This is the initial stage of smart fridge with internet access and digital access.
   c. SECURITY KEY PAD: Online security systems which are controlled by third party.
   d. REMOTES: Individual remotes for different devices.
4. The year 2015 is the year in which the machine is changed to mobile. In this year many devices have been connected to the mobile like mobile controlled lights and fans, smart thermostats that are operated by mobile devices, mobile keyless entry and Wi-Fi security camera, connected fitness tracker and many such devices.

5. Smart watches and fitness band are also a part of advancements in the fields of internet of things.

6. SMART GRIDS: This helps in knowing the information about the behavior of electricity suppliers and consumers in an automated fashion, this helps in improvement of efficiency, reliability and economics of electricity.

7. Connected health: This is a concept of health care system on which the research has already been started and this is being applied even in some places.

8. Smart Farming: This is a way to increase the quality and quantity of agricultural production by using sensing technology to make farms more intelligent. In the sensors are placed to monitor or early reproduction events in the animals. The monitored data are body temperature, the animal activity GPS position etc, the SMS will be sent to the breeder all this sensed information.

9. Smart Retail: This is software which allows the customer to buy all the household required good sitting in front of the internet.

10. The Microsoft Holo Lens announced shortly after CEs is an headset that alter reality. This device allows users to interact with holograms in real word and has a potential to enhance surgical procedures. Other head worn devices are Think, which allows to shift mid and energy levels and Linux IAS, this is a detection system for athletes[3][6].

11. Gogra Smart scooters are a device that that learns rider’s habits and allows the users to improve their driving habits every moment. As per the studies there will a lot increase in the use of devices with IOT as shown in fig.2.

![Fig.2. Increase in IOT use](image)

Using the Internet of things huge number of things can be converted to the network, this also includes a usage to trillions of sensors. The major benefits the IOT will bring are:

1. Tracking the behavior of real time marketing
2. Enhanced situational awareness.
3. Sensor driven decision analytics.
5. Optimized resource consumption.
6. Instantaneous control and response in complex autonomous systems.
7. The major forces that are pushing towards the development of IOT are:
   a. Ubiquitous Networks: This is connecting all the mobile phone and many other electronic devices to the Wi-Fi.
b. Connected computing: This is connecting all the electronic devices with each other.

c. Ubiquitous Sensors: Interconnection of many sensors.

d. Intelligence at the periphery of the network: Every drive or element of an electronic device acts as a mini database [11][12].

e. Marketing Automation: This is creating a network of knowledge of customer location and information with keeping the right balance with the user privacy.

III. BENEFITS OF IOT

- Transportation: Use of IOT simplifies the process by introducing monitoring sensors which give information about the distance travelled and time taken[9][10].

- Inventory management: In this a radio frequency sensors are tagged to track and maintain the inventory of products in real time as shown in

- Promotions: Many businesses use IOT to send mobile promotions to users by keeping list of the shoppers shopping history.

- Vending technology: IOT plays a major role in improving the working of vending machines by allowing them to monitor inventory levels and determine pricing etc.

- Assessing web user intelligence: IOT can be used to have better understanding of their customer; this can be done by tracking them on social media networks. This allows identifying the preferences of customer [4][7].

Fig.3. managing devices

IV. FUTURE

As of now, the Internet of Things (IoT) is primarily the field of revolutionary-minded technology practices. The advanced humanoids who use Google Glass to capture pictures, aim to be in charge of their home proximity or use their Smartphone to alter the light brightness in their bedroom. In a few years of time, things will be much different. By 2025, the Internet of Things will become more usable, having a monetary blow between Rs.40 lakh crores to Rs.150 lakh crores for each year.

That’s an attractive stunning guesstimate; especially known that in the present day Internet of Things is still within the primary stage of expansion. Even as the IOT has a bundle of prospective, receiving it to develop into a further reputable engineering could be demanding as shown in fig.4.
The solitary significant reason Internet-connected devices are still so uncommon is because often, each possess its own separate operating software. Nevertheless among 40 and 60 percent of the possible value of the IOT engineering depends on devices possessing the same software system. It’s difficult to supervise dozens of software programs on our smart device, besides all the alerts and push notifications. It is a true fact of existence that will be prone to get inferior before it gets superior. We will be soon going through this stage where we might own 20 special devices, and they will just be alarming continuously, and you must have to switch them off by hand [8][9][5].

Together with addition to software applications needing to secure themselves, for the Internet of Things industry to be adopted more widely, the infrastructure we live and work in will have to grow to be entrenched with Internet connectivity for devices to flawlessly and constantly work. The industry’s potential will also be resolute by a change in our mindset. As counterintuitive as it looks, Internet of Things entrepreneurs and inventors imagine a planet where we spend much less time stuck to our smart-devices, workstation screens or other linked tablets.

The enduring ambition with entrepreneurs and investors in the IOT room is highly splendid. By making a livelihood in a hyper-connected planet, we will all be more associated to each other, not less so as it sometimes seem in our contemporary technology-driven globe of smart-phones, computers and tablets[6][7].

As looking into the subsequent phases of this term and its technologies there are numerous opportunities and challenges to counter together with privacy and isolation concerns, safety and security, expenses, principles and standards, policies and set of laws, and the roll goes on.

V. CONCLUSION

In this paper we have discussed the importance of IOT. This technology influences a lot as there is ease in human life in various aspects. We have focused on different applications with respect to IOT. This sophisticated technology enables human beings to work efficiently with good utilization of time. It can be stated that IOT might rule in the coming years due to its prominence. Hence it can be concluded that Internet Of Things is the cutting edge and most useful technology which eradicates the routine human life problems.

REFERENCES


