

Internet of Things (IOT)

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ABSTRACT

Internet of Things (IoT) is fast becoming a disruptive technology business opportunity, with standards emerging primarily for wireless communication between sensors, actuators and gadgets in day-to-day human life, all in general being referred to as “Things”. This offers the capability to measure for understanding environment indicators.

This paper addresses the internet of things (IoT) as the main enabling factor of promising paradigm for integration and comprehensive of several technologies for communication solution, Identification and integrating for tracking of technologies as wireless sensor and actuators. IoT as envisioned is billion sensors connected to the internet through the sensors that would be generate large amount of data which need to analyzed, interpreted and utilized. Context aware capturing enables modeling, interpreting and storing of sensor data which is linked to appropriate context variable dynamically.

Building or home automation, social smart communication for enhancement of quality of life, that could be considered as one of the application of IoT where the sensors, actuators and controllers can be connected to internet and controlled. This paper introduces the concept of application for internet of things and with the discussion of social and governance issues that arise as the future vision of internet of things.

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I. INTRODUCTION

”IOT”- Anyone who says that the Internet has fundamentally changed society may be right, but at the same time, the greatest transformation actually still lies ahead of us. Several new technologies are now converging in a way that means the Internet is on the brink of a substantial expansion as objects large and small get connected and assume their own web identity. Following on from the Internet of computers,

whenour servers and personal computers were connected to a global network, and the Internet of mobile telephones, when it was the turn of telephones and other mobile units, the next phase of development is the Internet of things, when more or less anything will be connected and managed in the virtual world. This revolution will be the Net’s largest enlargement ever and will have sweeping effects on every industry and all of our everyday lives.

Smart connectivity with existing networks and context-aware computation using network resources is an indispensable part of IoT. With the growing presence of WiFi and 4G-LTE wireless Internet access, the evolution towards ubiquitous information and communication networks is already evident. However, for the Internet of Things vision to successfully emerge, the computing paradigm will need to go beyond traditional mobile computing scenarios that use smart phones and portables, and evolve into connecting everyday existing objects and embedding intelligence into our environment. For technology to disappear from the consciousness of the user, the Internet of Things demands: a shared understanding of the situation of its users and their appliances, software architectures and pervasive communication networks to process and convey the contextual information to where it is relevant, and the analytics tools in the Internet of Things that aim for autonomous and smart behavior. With these three fundamental grounds in place, smart connectivity and context-aware computation can be accomplished

Evolution of IOT:

1. Internet of Boffins

To establish a connection in between human brain and artificial brain so that machine can work like a human brain. The main aim is to upload human brain into machine. So that man can think, take decision without any effort. After the death of the body, the virtual brain will act as the man. So, even after the death of a person we will not lose the knowledge, intelligence, personalities, feelings and memories can be preserved for years in the form of a virtual brain.

2. Internet of greeks

'Internet of Geeks' era started with the proposal of IPv6. It was the latest revision of the internet protocol. The communication protocol provides identification and location system for computers on networks and routes traffic across internet. The

popular internet services started taking roots in this era. Amazon.com started its first online retail service in 1995, followed by eBay providing customers with online auction and shopping services. Hotmail started its free web based email service in 1996, followed by Google search in 1998. PayPal started its first internet payment service in 1998. Internet penetration was low in the market until 2000.

3. Internet of Masses

'Internet of masses' era started with the Dot-com bubble burst in 2000. In the starting of this era Dotcom bubble burst led to high growth in stock markets due to increasing use of internet in the industrial sector. In this era many people across the globe started using internet. Social networking sites came into existence. In 2001 Wikipedia came into existence followed by Facebook in 2004, further followed by YouTube, Twitter and WikiLeaks in the consecutive years.

4. Mobile internet

'Mobile Internet' era refers to access to the Internet via cellular phone service provider. The era got a boost with introduction of smartphones which gave a fast working internet on phones. This was the era from 2007-2011. There was steep rise in the use of internet by the people round the globe due to the mobile internet.

5. Internet of things

'Internet of Things' refers to an era where things can be connected to each other using internet.

II. DEFINATION OF IOT

"Today computers—and, therefore, the Internet—are almost wholly dependent on human beings for information. Nearly all of the roughly 50 petabytes (a petabyte is 1,024 terabytes) of data available on the Internet were first captured and created by human beings—by typing, pressing a record button, taking a

digital picture, or scanning a bar code. Conventional diagrams of the Internet . . . leave out the most numerous and important routers of all - people. The problem is, people have limited time, attention and accuracy—all of which means they are not very good at capturing data about things in the real world. And that's a big deal. We're physical, and so is our environment . . . You can't eat bits, burn them to stay warm or put them in your gas tank. Ideas and information are important, but things matter much more. Yet today's information technology is so dependent on data originated by people that our computers know more about ideas than things. If we had computers that knew everything there was to know about things using data they gathered without any help from us—we would be able to track and count everything, and greatly reduce waste, loss and cost. We would know when things needed replacing, repairing or recalling, and whether they were fresh or past their best. The Internet of Things has the potential to change the world, just as the Internet did. Maybe even more so

III. EXAMPLES OF IOT

- A lightbulb that can be switched on using a smartphone app is an IoT device, as is a motion sensor or a smart thermostat in your office or a connected streetlight.
- The Internet of Things refers to the rapidly growing network of connected objects that are able to collect and exchange data in real time using embedded sensors. Cars, lights, refrigerators, and more appliances can all be connected to the IOT.
- IoT helps in the prediction and management of natural disasters. For instance, take the example of forest fires. To avoid the chaos and destruction caused by a forest fire, various sensors can be installed around the boundaries of the forests. These sensors continuously monitor the temperature and carbon content in the region.

- A lot of security agencies make use of biometric systems to mark daily attendance, allow access to the authorized personnel only, and other related services. Advanced security, data communication, and minimized human intervention are some of the features of IoT being utilized in this sector. Biometric technology makes use of fingerprint, voice, eye, and face recognition.
- IoT can be used to connect cars with each other in order to exchange information like location, speed, and dynamics. An estimate shows that by 2020, there will be 24 billion connected cars in the world. We use IoT in our daily life without even realizing its presence. For example, while finding the shortest route, while driving semi-automatic smart cars, etc.

IV. LITERATURE SURVEY

"Internet of Things (IoT) is a new paradigm that has changed the traditional way of living into a high tech life style. Smart city, smart homes, pollution control, energy saving, smart transportation, smart industries are such transformations due to IoT. This article would help the readers and researcher to understand the IoT and its applicability to the real world.

With the Internet of Things (IoT) gradually evolving as the subsequent phase of the evolution of the Internet, it becomes crucial to recognize the various potential domains for application of IoT. This paper presents the recent development of IoT technologies and discusses future applications and research challenges.

This paper gives a detail analysis of various applications based on Internet of Thing (IoT)s. This explains about how internet of things evolved from mobile computing and ubiquitous computing. It emphasises the fact that objects are connected over the internet rather than people [1].

V. ADVANTAGES OF IOT

1. Ability to access information from anywhere at any time on any device;
2. Improved communication between connected electronic devices;
3. Transferring data packets over a connected network saving time and money;
4. Automating tasks helping to improve the quality of a business's services and reducing the need for human intervention.
5. Cost-effective operation.
6. Better Time Management.

VI. DISADVANTAGES OF IOT

1. As the number of connected devices increases and more information is shared between devices, the potential that a hacker could steal confidential information also increases.
2. Enterprises may eventually have to deal with massive numbers – maybe even millions – of IoT devices, and collecting and managing the data from all those devices will be challenging.
3. If there's a bug in the system, it's likely that every connected device will become corrupted.
4. Since there's no international standard of compatibility for IoT, it's difficult for devices from different manufacturers to communicate with each other.

VII. CHALLENGES OF IOT

- Insufficient testing and updating.
- Concern regarding data security and privacy.
- Software complexity.
- Data volumes and interpretation.
- Integration with AI and automation.
- Devices require a constant power supply which is difficult.
- Interaction and short-range communication.

VIII. CONCLUSION

The design phase of IoT is a very fast field with umpteen number of challenges. Many of the common design challenges faced in Embedded field apply to IoT as well, with some specifics. This sharing is based on our hands-on product building experience. Might vastly vary between different types of IoT devices. By having an engineering approach, many of the issues can be resolved.

IX. FUTURE SCOPE

- The future of IOT has the potential to be limitless.
- Advances to the industrial internet will be accelerated through increased network agility, integrated artificial intelligence(AI) and the capacity to deploy, automate, and secure diverse use cases at hyperscale.
- IOT adoption is paving the way for smart cities..

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