An Empirical Study on Internet of Things

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Abstract - **Currently, the main communication form on the Internet is human being. But it is predictable that any object will have a distinctive way of authentication and can be addressed so that every system can be connected. The Internet will become to the title of Internet of Things. This will bring a new universal computing and communication generation and change people's lifestyle. Radio Frequency Identification techniques and related authentications technologies will be the cornerstones of the upcoming Internet of Things. This paper intention is that to show a structure of the Internet of Things and we try to address some essential issues of the Internet of Things like its architecture and the functionality, etc. At the beginning we describe an inspection of the Internet of Things. Then we give our architecture design of the Internet of Things and then we design a specific the Internet of Things application model which can apply to automatic facilities management in the smart areas. At last, we examine some open questions about the Internet of Things.**

Keywords: Sensors, Gadgets, Authentication, Digital Signals, Network.

I. Introduction

"The internet of things is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction."

Internet and its applications have become an essential part of today's human life style. It has become an essential tool in every facet. Due to the huge demand and necessity, researchers went apart from connecting just computers into the web. These researchers led to the birth of as sensational devices, Internet of Things. Information Interchange over the internet has spread from user - user interaction to device – device interactions now a day. The IOT theory was proposed years back but still it's in the first stage of commercial deployment. Home automation industry and transportation industries are seeing fast growth with help of IOT. Since most of the process is done through the internet we must have an effective high speed internet connection. All the gadget's we

use in our daily life can be controlled and guided. A majority of process is done with the help of sensors in these gadgets.
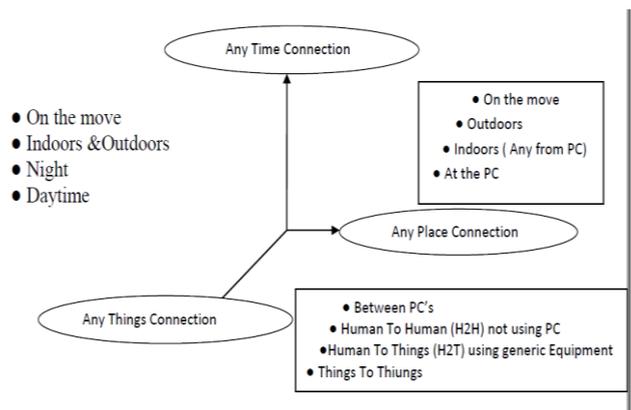

Figure 1: Components of IOT

Sensors are placed everywhere and these sensors convert raw physical data into digital signals and transmits them to its central unit. By this way we can monitor environment changes remotely from any part of the world through internet. This systems architecture would be based on context of operations and processes in actual time scenarios.

II. How does IoT works?

The way IoT solutions work is quite interesting. Since we know now what IoT is, it is clear that it uses significant data to communicate with other devices. Devices that have built-in sensors are connected to IoT platforms which stores data from all the connected devices. The important data is then used to perform tasks that fulfill the needs of people. When we collect data in the IOT platforms, it does not mean that all the data is useful which stored this concept known as Big Data concept. Devices carefully select only selected data that is actual to execute an action. These parts of information can collect patterns, recommendations and limitations before they occur. What is IoT without the internet? After all, it is the connecting medium that plays the crucial part in this system. When IoT application developers are building the apps they must keep in mind the availability and strength of connection in the particular area. IoT application works on smart devices that automatically complete the tasks with address. There are many examples that show working of IoT in real life today.
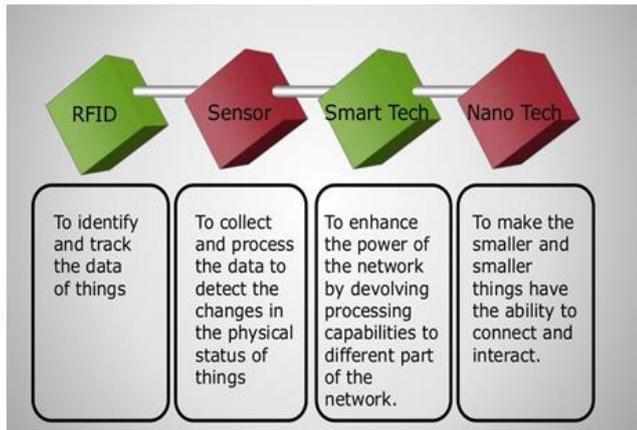
Figure 2: Working of IOT

In simple words, IoT is a concept where any device is connected to other devices over the internet and has an on and off switch. IoT is a massive network connecting devices with people with the help of internet. The details exchanged within this network and are used to determine how the devices will be used in certain environments. These devices include coffee makers, washing machines, TVs, music system, wearable, etc. Basically, it includes any electronic device that can be controlled through another device. This type of communication is called machine to machine communication. Any device that is being controlled by the humans will take commands and pass them to the right devices and with minimum human intervention, the tasks are completed.

The concept of IoT is being used by homes as well as offices to monitor whatever is happening inside and outside. In this way, people increase the safety of their families and businesses can improve productivity and reduce any wastage. Other ways IoT solutions are being used is in luxuries cars. Driverless cars are the new goal for car companies such as Tesla, BMW, Google, etc. They are using multiple technologies to invent something as solid as driverless cars. The IoT applications in healthcare industry are playing a key role. The USA is leading in using IoT applications for healthcare by providing immediate assistance during an emergency, virtual nurses and doctors and other facilities.

III. Applications

3.1 Smart home

Smart home ranking highly Internet of Things application on all measured channels. The IoT Analytics database for this includes overall 256 companies and startups. Most of the companies are active in smart home rather than any other application. For smart home the total amount of funding startups currently exceeds $2.5 billion. This list includes prominent startup names such as Nest or Alert Me as well as a

number of multinational corporations like Philips, Haier, or Belkin.

3.2 Smart Infrastructure

Smart city spans several of use cases like management of traffic to water distribution, waste management, security in urban region and environmental monitoring. Its popularity is fueled by the fact that many by smart city solution it solves the real pain of people living in cities these days. These solutions of Smart Cities controls the traffic, congestion problems, and reduce the noise pollution and helps to make cities safer than before.

3.3 Connected Health (Digital health/Telehealth/Telemedicine)

In IoT Connected to the health remain the sleeping giant and this concept of a connected health care system and smart medical devices not just for companies also for the well-being of people in general life. Connected Health in IoT has not reached the masses yet but prominent use cases and large-scale startup successes are still to be seen in daily life.

3.4 Transportation

The connected vehicle is coming up slowly that the development cycles in the automotive industry typically take 2-4 years; we have not seen much buzz around the connected vehicle yet. But it seems we are getting there. Most large auto makers as well as some brave startups are working on connected vehicle solutions. And if the luxurious cars manufacturers of this world do not present the latest generation internet connected to their cars soon, other companies like Apple, Google etc. have all announced connected car platforms.

3.5 Industrial

The Internet of Things applications include Industrial internet is one of the main application. While many market researches such as Deloitte or Ernst and Young seethe industrial internet as the IoT concept with the highest overall prospective, its popularity currently does not reach the masses like automated houses. The industrial internet has going so far. The industrial internet gets the highest push of people on Social media compared to other non-consumer oriented IoT Applications.

3.6 Smart retail

Subset of smart retail as Proximity-based advertising is somehow starting to takeoff. But it shows that it's still a niche segment by using the popularity ranking. One post on

LinkedIn per month is nothing compared to 430 for smart home.

3.7 Smart supply chain

Smart Supply chains have been getting smarter. The Solutions for track the goods when they are on the roads or getting information from the suppliers to exchange inventory information have been on the market. So, that while it is perfectly logic that the topic will get a new push with the IOT, its popularity remains limited.

IV. Challenges of IOT

- Meeting customer expectations.
- Easing security concerns.
- Keeping IoT hardware updated.
- Overcoming connectivity issues.
- Waiting for governmental regulation.

V. Conclusion

The IOT devices will became a big role in daily life objects for how we interact with them. These devices are getting smarter day by day through machine learning and how future is happening today with the artificial intelligence. To prove that IOT is taking off rapidly, and it will only continue to grow as technology improves. There is big money in the Internet of Things devices overall currently investing.

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