IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

A Study on Web 5.0 Views of IOT (Internet of Things) Towards Smart Building Implementation That Secures and Protect Our Life

Vaibhav Sharma

School of Computer Application & Information Technology, SGRR University, Dehradun, India – 248 001,

ABSTRACT

We know that Internet of Things is the network of things i.e. physical objects[1].Such as vehicles and so many things that have embedded technology such as electronic sensors software etc. The aim of this study is to develop a new era of IOT with reference to web 5.0. In this paper i will co-relate the uses of web 5.0 with IOT and also focus on a secure system that warns us during any disasters.

Key words: IOT, Internet of things web 5.0, sensor, emotional web, Future web, smart building, web 1.0, web2.0, web3.0, web 4.0.

INTRODUCTION

The Internet of Things (IoT), sometimes referred to as the Internet of Objects, will change everything including ourselves [3] .Emerging technologies in recent years are Internet of Things. It is used in various areas and it provide benefits in different domains such as it minimizes the human efforts i.e. our system is smart enough to interact then our interaction is always minimum, usage of resource available is more efficient and other benefit of IoT is that it saves our time and it improves security level. Internet of Things is basically platforms which are embedded with electronics, software and sensors to the internet and this enables us to collect as well as exchange between these things.
IoT includes four main components that are-

Sensors and actuators-Sensor collects the information like temperature of humidity and actuator [2] such as modular relay performs an action.
Network- Network is to use to transmit the signal collected by sensor. Connecting of different parts of network has routers, bridges and topologies. During the implementation of IoT various challenges have been faced by network they are: power consumption, security, etc.
Data Analysing-IoT devices collects such abundance amount of data we cannot store them in tables and run search queries on them we need to depict in real time so that intelligent decision can be made right then and there. IoT devices are become smarter to level that we can measure information at a faster space.
Action-It can be denoted two interfaces i.e. M2M and M2H. It has lower machine price. It has a deep learning tool.

The main objective of Internet of Things is that to make the city smarter by upgrading the resources, by urban farming, reducing traffic jam, providing services to travel fast and an essential security system is to be implemented.

OBJECTIVE OF IOT SYSTEM

Today it's all about non-human conversation or machine-to-machine communication. Automatic, Smart, Intelligent and Interconnected devices making our life easier by rendering services even before we know we want them. Accenture has predicted that by 2030 the world economy whopping $14.2 Trillion Dollars from the IoT domain [5].
By 2030 a total of 32.9 billion IOT devices will be created or exported to get connected with IOT and 4.5 billion will be using a cellular technology.Now a day, we notice that this technology is applied in most of the areas like temperature, humidity, energy saving, cooking and in-home appliances etc. The main aim of IoT applications is to provide safety and security, for preventing crimes. IoT also provides the network security. It also collects, aggregate, monitor and normalise data from IoT devices. It also provides the ability to verify and authorize data movement between the IoT devices. It maintains the data integrity and prevents data from hacking. IoT technology cannot help to stop disasters from occurrence, but it is useful for preparedness, predict and early warning system. It also monitors the forest fire with the help of sensors on tree and so on.

Purpose and Implementation of IoT-Japan experienced frequent earthquakes and a huge damage/destroy of human lives, buildings are caused during earthquakes. Earthquake is one of the natural events that occur almost every day in different parts on the earth. It causes millions of people die and homeless. The latest event was recorded in Nepal in April 2015. It took nearly 9,000 human lives and injured more than 22,000 people [6].Various problems have been identified after this disaster that are-

1. Many people have lost their houses, they were severely injured, they lost their family, etc.
2. Lack of food, water and pasteurizing plant supply.
3. Effects on natural environment such as soil liquification, ground resources, landslides, etc.
4. High intensity earthquake can also cause severe flooding.
5. Common side effect of earthquake is that Fires started from broken gas lines which may cause a huge damage on effected areas.

The rapid environment impact assessment in disaster-

I. Rescue operations are started immediately to save the life of victims.
II. Immediate recovery of damaged buildings and infrastructure.
III. Affected cities and countries are rebuilt immediately.

To fulfil these requirements, a quick response communication system is used to determine whether the building is safe or damaged. In the past when earthquake occurred in Japan, it takes a long time to identify that how many peoples get affected during the earthquake and how many areas get affected during earthquake. To avoid such loss of time and resources we use Internet of Things to get the information about the area is safe and which area is affected within the fraction of seconds and immediate result is sent to owners.
In structural engineering, with high reliability experimental methods are evaluated, judgement of behaviour and damage of building is established. Many judgements of damage identification are proposed. Usually, the strain diagram of a column and a beam under loading condition are acquired by the computation of strain gauge. The behaviour of building can be imagined by looking up these results and damaged locations and point of excitation can be recognized. State of building can be measured by this method.

WEB 5.0 VIEW OF IOT

Web 5.0 is the next generation web it co-relate the properties of a linked and intelligent web to make emotional web. Emotional web means it can map the feeling of any things in real time environment.IOT with 5.0 provides new generation the man, machine interaction. These real life concepts will come in future when a machine will be very intelligent and feels many things and react according to the situation as a living thing can do. Web 5.0 provides the emotional interaction between human and computing devices .This interaction will take place based on neuro-technology.

Comparison between web1.0, 2.0, 3.0, 4.0 and 5.0

Web 1.0:- It is also known as static web. It is read only web i.e. User can only read the data which are available or provided by the web. Static web sites are the example of web 1.0 we can only search the information and only read it.
Web 2.0:- It is also known as writing and participating web. From this we can read-write and publish information or data. Twitter, YouTube, Facebook etc. are the example of web 2.0 where we can read-write and contribute the contents.

Web 3.0:- It is semantic executing web. It read-write-execute web. It contains two main terms semantic markup and web services.
Web 4.0:- It is also known as mobile web it is not new web but a **substitute** of previous web which we have already discussed. Web 4.0 connects all things devices using mobile phone.
Web 5.0:- It is also known as emotional web, it collects open, linked and intelligent web hence it is emotional web. It refers the emotional interaction between man and machine.

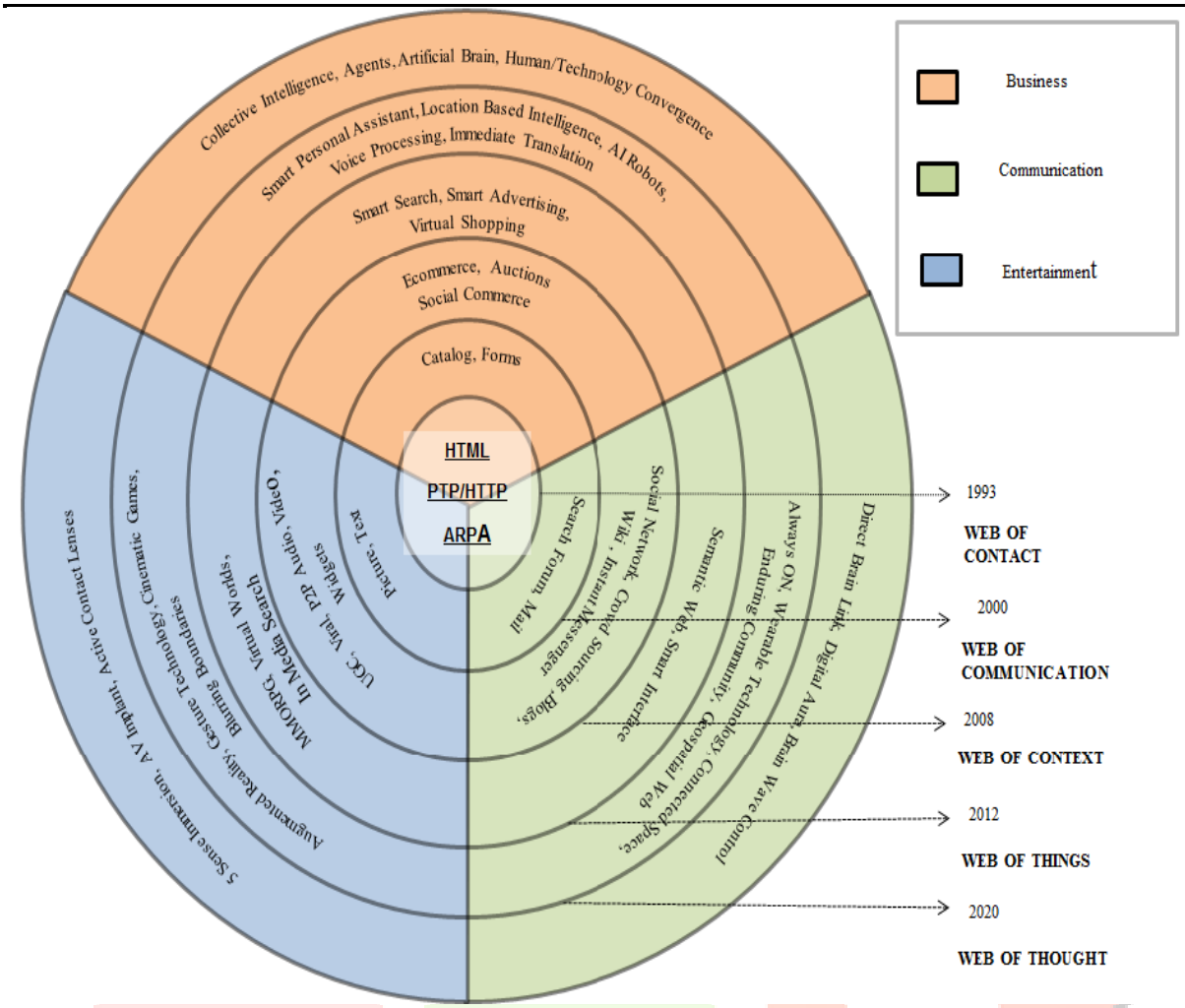

Fig.1 Web Expansions [7]

RESULTS AND DISCUSSION

Implementation of different things based on IOT Web 5.0

As we know IOT is the future of technology. Many government and non-government firms tries to implement IOT technology somehow we are in progress of implementing the IOT 5.0, we will focus on some areas where we can implement IOT 5.0.

1. Smart building implementation models based on IOT 5.0.
2. Smart devices implementation based on IOT 5.0.
3. Smart machine implementation based on IOT 5.0.
4. Smart machine (robots) which act as a human.
5. A smart machine which are able to create another machine.
6. A smart machine which inform and perform specific actions before happening of any unwanted situation etc.

KEY PPOINTS OF IOT

As we discussed, our focus is on the warning of safety and security during flood. IoT system developed for disaster management, we must take into consideration of following areas they are: Device used should not use external power supply, method used should be authentic for measuring the current situation of the building, examine large and varied data sets, and modify the alert networks.

1. **Power Harvesting** :-

   Power Harvesting (Energy Harvesting) is the process by which energy is obtained from outer source. Throughout the occurrence of the disaster, in all area functioning has been stopped and power interruption has occurred. To get the current situation of framework, many measuring points is needed. So, energy harvesting is used to transfer power under these conditions or we can say that for that for the creation of IoT system every house can generate power supply.

2. **Measuring the state of building**:-

An organic piezoelectric film is used to measure the strain caused in the building. Electromechanical conversion for sensor and electrical harvesting has been done through piezoelectric because it`s simple installation into mechanical source and simple compared to magnetic field-based generator. These fields are used more because of its strong physique and they are highly flexible. In building there are numerous measuring points and various conditions of building top material are considered. Thus, selection process of locating the measuring point is in the order of the data obtained by building structural engineering tests.

3. **Analysing Big Data for building**:-

Many data points are analysed during the investigation of building status. Data analysis get difficult because a house has various type of materials such as wood, concrete, steel, etc. Hence, we use different techniques such as machine learning and artificial intelligence. Due to the rapid expansion in the networks nowadays, the number of devices and sensors in networks are increased more and more in the physical environments which will change the information communication networks, services and applications in various domains [4].

4. **Communication channels and Alerts**:-

After disaster current situation of building has been sent to related people with analysed result. From this information victim choose either to go home or not or building needs repair or not. Thus, there is increase in volume of data transmission and communication range gets expanded.

For the data gathering for building, wireless modules of low power consumption are preferred because batteries of wireless devices inside the building could not replace. IoT uses wireless communication for higher range on low frequency bands, for collection of data from sensor. For higher range communication, we select Wi-SUN, which works on 920MHz band, with IEEE 802.15.4g for PHY and IEEE802.15.4e for MAC, which fit in serial low power consumption communication. At every hundred meters access points of Wi-SUN is placed where all collected data from sensors are delivered to data centre. When the damage is analysed all the information collected from the sensor will send to people by various wireless communication systems.

Objectives and technical knowledge of fundamental and practical research are discussed above. Advancement of IoT system needs combination of interdisciplinary methods, devices and technologies.

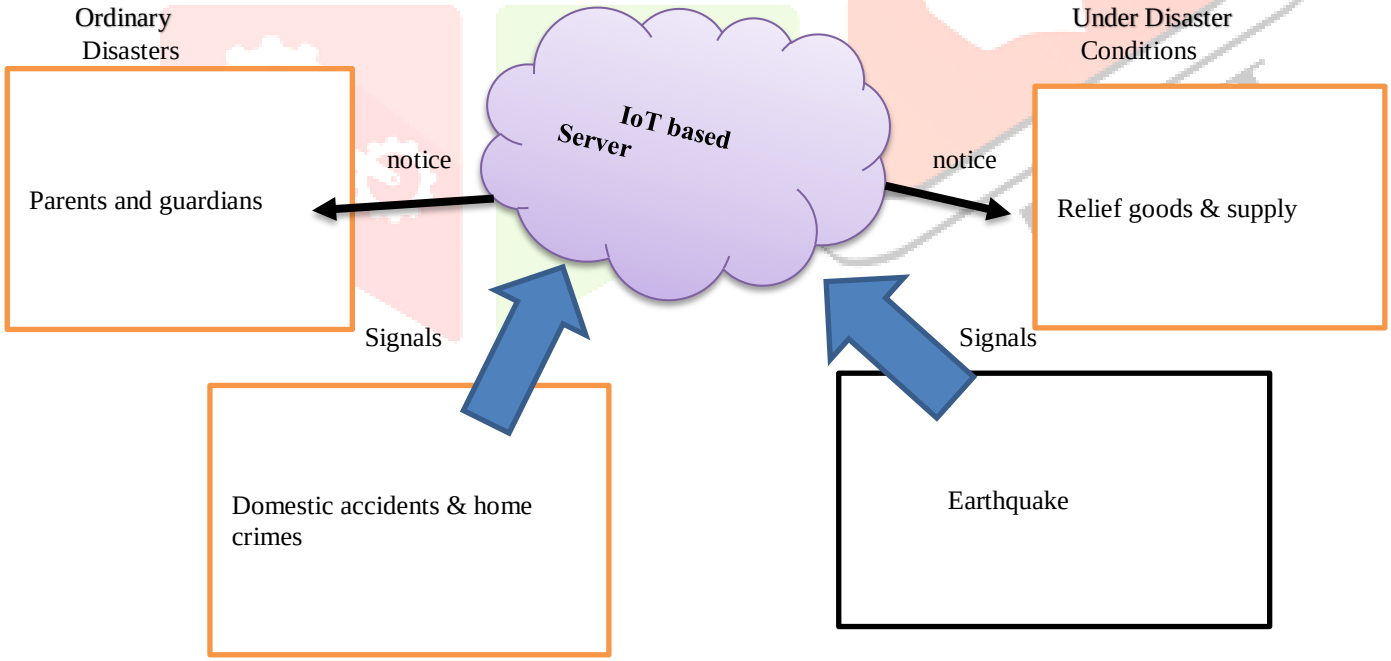

Figure 2: Conceptual image of the IoT system house

Figure 2 Demonstrate the notification survey if a building suffers any domestic accident or home crime(Ordinary) as well as those that will occur in the event of a natural disaster (Under Disaster conditions).

To build smart building implementation we will have some building blocks as to effectively handle the power supplies to operate IOT systems as to measure and monitor. We have sensors, network for response the things, data analysis and security to identify the state and safety of system.

In future our building will capable to check about its safety and security during disasters. i.e. house will notice its own discomfort.

CONCLUSION

During the natural and manmade disaster, there is a reduction in chances of human lives as well as damages of large-scale framework in adopting new technologies. For a feasible explanation of disaster management, web 5.0 view of IoT provides a smooth and continuous interconnection among different devices having multiple functionality. If any accident has occurred, IoT -implemented disaster management systems recently conveys alert with the help of its data analytics and artificial intelligence tools. Because the effect of disaster is very large so IoT-implemented disaster management system is used to find the victims and possible rescue operations. This article encapsulates that IoT -based technologies applicable for disaster management and their adequacy for applying it in adverse situations. For IoT-based disaster management system, during the inspection, open research challenges and fundamental design principles are introduced. During the study of IoT-based disaster management

REFERENCES

[1]https://en.wikipedia.org/wiki/Internet_of_things
[2]https://iot.ieee.org/newsletter/january-2017/internet-of-things-for-buildings-that-make-life-safe-and-secure.html
[3] M. A. Ezechina, K. K. Okwara, C. A. U. Ugboaja. The Internet of Things (Iot): A Scalable Approach to Connecting Everything. The International Journal of Engineering and Science 4(1) (2015) 09-12
[4]https://5g-ppp.eu/wp-content/uploads/2014/02/Advanced-5G-Network Infrastructure-PPP-in-H2020_Final_November-2013.pdf
[5] https://www.linkedin.com/pulse/internet-thingsiot-machine-learning-level-21-shwetank-pandey
[6] (Apr. 2015). Nepal Earthquake: Eight Million People Affected, UN Says. Accessed: Apr. 29, 2017. [Online]. Available: www.bbc.com/news/worldasia-32492232
[7] https://flatworldbusiness.wordpress.com/flat-education/previously/web-1-0-vs-web-2-0-vs-web-3-0-a-bird-eye-on-the-definition/