

ISSUES BASED ON INTERNET OF THINGS

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Abstract:

The Internet of Things is emerging as the third wave in the development of the internet. It refers to the environment where network connectivity and computing capability extends to objects, sensors and everyday items not normally considered computers. These items are then capable to generate, exchange and consume data with minimal human intervention. Devices or things and technologies came into existence playing significant role and helps doctors or physicians to add wisdom to their decision in healthcare monitoring. IOT as a whole is very broad area. This paper explains the concepts of IoT, healthcare monitoring, its overview and adoption to our homes.

Keywords:

Internet of Things (IoT)_Sensor_Healthcare Monitoring_Fog Computing_Environmental Monitoring_Smart Homes.

1. INTRODUCTIOB

In this paper, the definition, status, components, and standards of IoT (Internet of Things) are introduced, and possible business models that can implement IoT in a smart city are examined. The Internet of Things (IOT) is an emerging topic which includes the entire world. This term was coined by Kevin Ashton in his demo in the year 1998 from which the importance of it has been increased rigorously. In IoT, devices assemble and communicate information directly with each other via internet and the cloud manages to collect record and analyse data

blocks. Introducing IoT into embedded mobile transceivers into a wide range of devices, would add a whole new level to the world of information and communication technology. This technology includes a wide spectrum of networked products, systems, and sensors. Cloud computing has emerged and widespread to meet the demand of latency, reliability, security and efficiency. In order for a smart home heterogeneous set of things to operate with little or no human intervention a management system will be needed. The lack of such a management system along with the cost of the current devices has been a major factor in preventing customer from embracing the connected devices in their homes.

1.1 Definition of IoT:

The rapid development of information technology (IT) has brought forward a hyper connected society in which objects are connected to mobile devices and the Internet and communicate with one another. In the 21st century, we want to be connected with anything anytime and anywhere, which is already happening in various places around the world. The core component of this hyper connected society is IoT, which is also referred to as Machine to Machine (M2M) communication or Internet of Everything (IoE).

1.3 Market Trends:

The Internet of Things is a phenomenon where tiny machines have the ability to sense, respond, compute, and connect to the Internet, providing unprecedented access to control things and the environment around us. While it is still in its infancy, the time is ripe now with all the key ingredients in place – low price points for the devices, explosion of smartphones, tablets, PCs which are essential for providing the ability to manage and control the devices, broadband access to the Internet in homes, consumer demand, and manufacturers providing the capabilities to differentiate their products for an explosive growth over the next decade. Connected home device shipments will grow at a compound annual rate of 67% over the next five years, much faster than smartphone or tablet device growth, and hit 1.8 billion units shipped in 2019, according to BI Intelligence estimates. Connected home devices include all smart appliances (washers, dryers, refrigerators, etc.), safety and security systems (internet connected sensors, monitors, cameras, and alarm systems), and energy efficient equipment like smart thermostats and smart lighting, healthcare for remote

monitoring, diagnostics and services. Some of these areas like healthcare are in the stages of infancy, whereas, security and energy efficient equipment are in the early growth phase.

2. *Communication:*

Zigbee or Thread like suite of highlevel communication protocols to create personal area networks, designed specifically for the home. Mesh network designed to securely and reliably connect hundreds of products around the home – without blowing through battery life. Designed to support a wide variety of products for the home: appliances, access control, climate control, energy management, lighting, safety, and security. Designed to have extremely low power consumption. Devices efficiently will communicate to deliver a great user experience; yet will run for years on the smallest of batteries.

2.1 *Sensor and Technology:*

IoT is described as a connection of various “things” or “objects” around us, like, sensors, mobile phones, Radio Frequency Identification (RFID tags) which work through a unique addressing system with which these things are able communicate with each other and complete their tasks successfully. The role of RFID systems (used to identify and communicate with other devices). IoT mainly depends on Wireless Sensor Networks(while compile the information (which compile the information collection, processing and transformation), intelligent technologies (in order to solve problems and initialize and control the machine-to-machine interaction). Nano-meter technologies (to construct small devices in order to socialize the IoT applications). There is still research being conducted in the field of IoT in order to make it more easy to use and also increase the security of the information transferred through it.

3. *Healthcare Monitoring:*

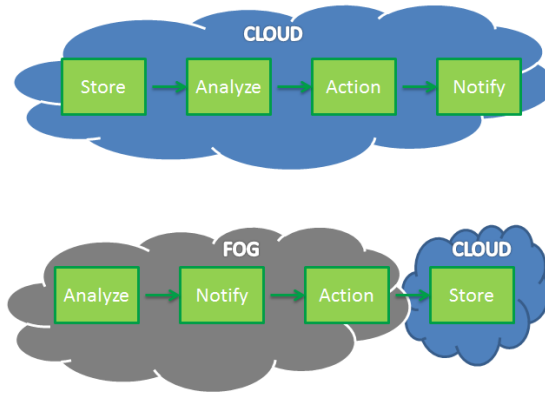
The IoT technologies such as RFID, WSN, etc., could provide many benefits in the healthcare domain. C2F U-healthcare monitoring system, tier 1 is called as Health Sensor tier. This is designed for machine-to-machine (M2M) interaction, collects, process the data, and issues control commands to the actuators. It also filters the data to be consumed locally, and sends the rest to the higher tiers. It consists of “Things” (T in IoT) which means sensors and devices. Here the patient related health information is captured by networked sensors, either body worn or embedded in our daily living activities with which the patient is equipped for personal monitoring of multiple parameters. The captured data can be also augmented with situation information like time, temperature, date. These health monitoring devices can range from blood pressure and heart rate monitors to advanced devices capable of monitoring specialized implants, such as pacemakers or advanced hearing aids.

4. *Big Data and Analytics:*

Big data analytics is the process of examining large amounts of different data types, or big data, in an effort to uncover hidden patterns, unknown correlations and other useful information. As the IoT will by definition generate voluminous amounts of data, the availability of big data analytics is a key enabler. Currently also Google nest uses this to carve out usage patterns of user and make auto adjustments to the temperature after learning the user behavior and preferences. So, this technology in general will enable importantly interconnecting the data from different devices from home, drawing more intelligence collectively and allowing various innovative applications emerging based on the same.

5. *Fog and Cloud computing:*

Fog (Edge) tier also called as multi-service edge. While Fog nodes provide localization, therefore enabling low latency and context awareness, the Cloud provides global centralization. Cloud is secret weapon in internet of things and IoT is the next big market for cloud. Smart objects will be endowed with sensors that will feed data back to cloud platforms for analysis. The cloud is the only technology suitable for filtering, analyzing, storing, and accessing that information in useful ways. Cloud computing will be driving Internet of things in every step of the way forward.

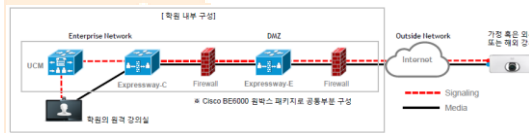


5.1 Smart Education Service:

Service Outline

This service provides real-time, interactive high-definition lectures that feel like face-to-face meetings at home through high-definition (HD) services and wide-area Internet infrastructure. Instructors participate in the lectures by using equipment in private educational institutes or separate places, and even foreign language teachers in other countries can access this service through the Internet.

Service Diagram

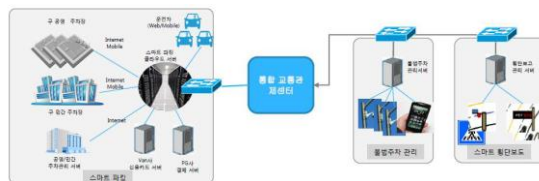


6. Environmental Monitoring and Energy Management:

Environmental monitoring applications of the IoT typically use sensors to assist in environmental protection by monitoring air or water quality, atmospheric or soil conditions, and can even include areas like monitoring the movements of wildlife and their habitats. Integration of sensing and actuation systems, connected to the Internet, is likely to optimize energy consumption as a whole. It is expected that IoT devices will be integrated into all forms of energy consuming devices (switches, power outlets, bulbs, televisions, etc.) and be able to communicate with the utility supply company in order to effectively balance power generation and energy usage.

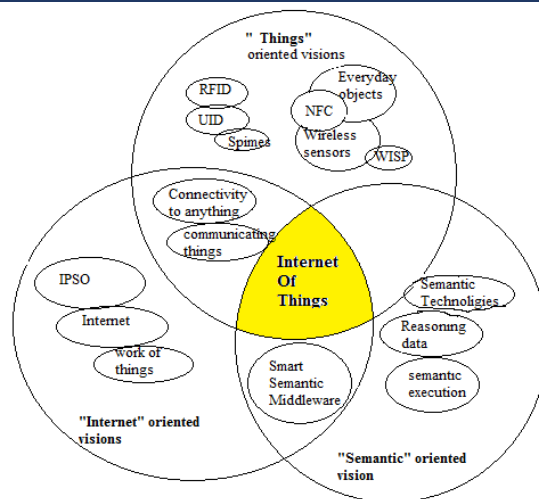
6.1 Smart Homes and Smart City:

At home, appliances as your basic toaster now come with an embedded MCU that not only sets the darkness of the piece of toast to your preference, but also adds functional safety to the device. Your refrigerator has started talking to you and keeping track of what you put in it. There are energy-aware HVAC systems that can now generate a report on the activity in your house and recommend ways to reduce your energy consumption. Recently, many local governments have been aiming to implement an IoT-based smart city through the construction of a test bed for IoT verification and an integrated infrastructure



Review:

IOT has been described or defined in various perspectives, thus IoT is explained in different ways. The main reason behind these many definitions is because of the two words “Internet” and “Things”. Internet points towards a combination of networks and things mainly consist of generic objects.



7. Conclusion:

In future IOT is going to become a reality. It will change our life style. But there are many challenges to face related to the deployment, growth, implementation, and use of this technology. The Internet of Things involves a complex and evolving set of technological, social, and policy considerations across a diverse set of stakeholders. But it will be a boon for us in future. The further research aims to extend with elaboration of framework for C2F U-healthcare monitoring system or other use cases of Internet of Things with enhanced support and other elements or technologies combinations. We hope that more research in this field will be conducted in the future.

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