

A SURVEY ON KEY TECHNOLOGIES AND APPLICATIONS OF IOT

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Abstract - Internet Of Things is absolutely Networked and Connected Devices causation analytics information back to cloud or information centre. The definition of net of factors is that it's the network during which each object or thing is provided distinctive symbol and information is transferred through a network with none verbal communication. The rapid climb of technology has enabled individuals to form their life easier by victimization varied devices that are obtainable within the market. Smart phones could be a model of such devices. Several applications are obtainable for each residential similarly as industrial institutions. Device applications for internet of things are sensible Parking, Environmental observance, Temperature observance, Earthquake detection, producing, Storage Incompatibility detection, Home automation, Transportation. The core of internet of things is Government, Enterprise and residential. There are variety of job opportunities obtainable for IT professionals. As per the analysis, at now there are regarding nine billion net connected devices obtainable that are expected to be twenty six billion by the tip of the year 2020.

Key Words: IoT, Internet of Things, Smart city, Creative economy, Sensor, Business model, RFID,ZIGBEE.

1.INTRODUCTION

In today's trendy and good trend folks expect new devices and new technologies to change their day to day life. The innovators and researchers area unit continually attempting to search out new things to satisfy the folks however the method continues to be infinite. Within the early Nineties, net property began to proliferate in enterprise and client markets, however was still restricted in its use due to the low performance of the network interconnects within the 2000s net property became the norm several applications and nowadays is predicted as a part of many enterprise, industrial and shopper merchandise to produce access to data. However, these devices area unit still primary things on the net that need a lot of human interaction and watching through apps and interfaces. The target of IoT is something, Anyone, Anytime, Anyplace, Any service and any network. Fig.1 describes the coupling of C"s and A"s. That reveals, folks and things may be connected anytime, anyplace, with anyone, ideally by mistreatment in any path/network and any service.

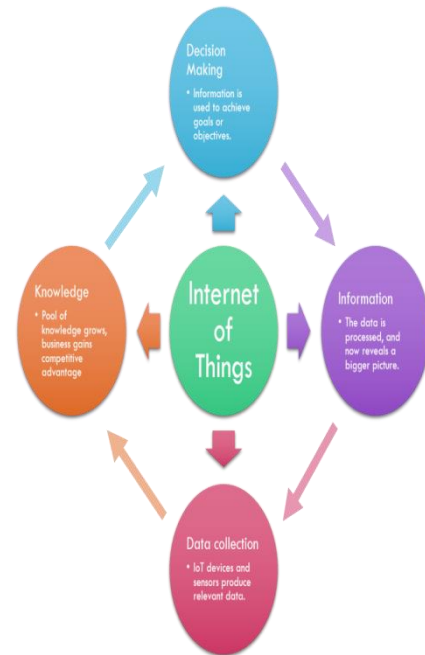


Fig -1: Internet Of Things

2. DEFINITION OF IOT

The Internet of Things (IoT) could be a system of reticulate computing devices, mechanical and digital machines, objects, animals or folks that square measure given distinctive identifiers and the flexibility to transfer information over a network while not requiring human-to-human or human-to-computer interaction.

3. ARCHITECTURE OF THE INTERNET OF THINGS

Usually the IOT is divided into three levels: perception layer, network layer, application layer. The main function of the perception layer is overall perception, it can acquisition information whenever and wherever by using RFID, sensors, two-dimensional code. RFID technology, sensing and control technology, short distance wireless communication technology is the main technology on the perception layer, including chip development, communication protocol research, materials, smart node power supply and other segments.

The main function of the network layer is to realize the two-way transmission between the perception data and control information, and through the integration of telecommunication networks and the Internet to transmit

the information in real time. After the sensor senses the item information, need to transfer to the background through the network to deal with. At present, the advanced technology of network transmission information application includes: IPV6, New type of wireless communication network (3G, 4G, ZIGBEE and so on), Ad hoc network technology. It is developing faster transmission speed, wider bandwidth, higher spectrum utilization, more intelligent access and network management. Network layer also has the function of information storage, network management and so on. The application layer is analysis and processing of the data, to provide users with a specific services. Cloud computing platform is the storage of mass data, analysis platform, is not only an important part of the Internet of things, but also the basis for application of many applications. Application layer is the goal of the development of things, the software development, intelligent control technology will provide users with a variety of application of the IOT.

4. KEY TECHNOLOGY OF IOT

4.1. EPC(Electronic Product Code)

The first introduction of the IoT derives from a "things oriented" perspective wherever issue is taken into account the items were terribly easy items radio frequency identification (RFID) tags. The construct of IoT design to many scenarios just like the Auto ID labs, EPC, object name service(ONS), all this idea have target to architect the IoT with international designed. The Aim of EPC is supporting use of RFID and unfold it to the world-wide network for the contemporary way forward for network and additionally produce the sensible trade for traditional international for EPC global network. EPC was developed by Auto-ID from Massachusetts Institute of technology for purpose of sharing knowledge in real time by discovering a unique symbol and use RFID, wireless communication technology through net infrastructure and platform.

EPC: it's a ninety six bit code and it's divided into four classes, first partition is Header, 0-7 bits that describe the numbers, types and length of future data, the target of header is to provide extensibility for resulting and future data requirement. Second partition is Manager, 8-35 bits, it's outline responsibility to maintenance 2 state of affairs, object sort code and serial numbers in their domain. Tired is Object category, 36-59 bits, the duty of object class is to be used for abundant range otherwise the other object-grouping that is developed by the EPC manager. Fourth is Serial range, 60-95, its describe the encryption a novel object identification number for all kinds, it provide $2^{36} = 68, 719, 476, 736$, distinctive identifiers. EPC have completely different component, EPC encryption, EPC tage, reader, EPC savant, ONS server, PML, EPC-IS.

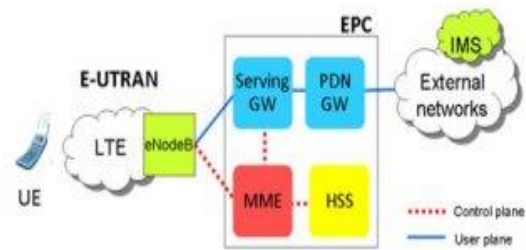


Figure 2: Basic EPS architecture with E-UTRAN access

Fig -2: EPC Architecture

4.1. RFID Technology

RFID(Radio Frequency Identification) is that the conception of exploitation radio signals to mechanically find an object for storing associated remotely retrieving information, generally component of RFID Composed of, Tags, Tags Reader, Antenna, Information management software system, Database Data is captive and transferred between information sender and information receiver device by radio waves. The sender information piece is known as tags and recipient info piece is termed reader or tag reader. tags square measure sometimes placed on the objects. If we tend to place tags in classes supported the ability provide, there would be 3 main forms of them; Active tags, Passive tags, Semi-active tags.

Active and passive tags square measure terribly completely different, however it will be noted that active tags receive the energy required from mobile battery, while passive tags haven't any power offer by them, exploitation the energy of electromagnetic radiation emitted by the tag reader, having less range and scope reading than active tags. Another Another form of tag is additionally semi-active that additionally to its internal battery use, it will use the energy waves emitted by the tag reader. Antenna is employed for transmittal radio signals between the tag reader and tag itself, getting used for each. there's info management code for processing and information assortment. This software-typically on an area server- permits the info changed by tag reader being collected and accepted, keep and retrieved in an exceedingly database just in case of a need. RFID technology will be a substitute for barcodes. in reality RFID is over a barcode as a result of it's an automatic system of scanner. These 2 technologies have major variations. the most distinction is that RFID technology is capable of handling massive volumes of information that necessary collected the info by tags reader.

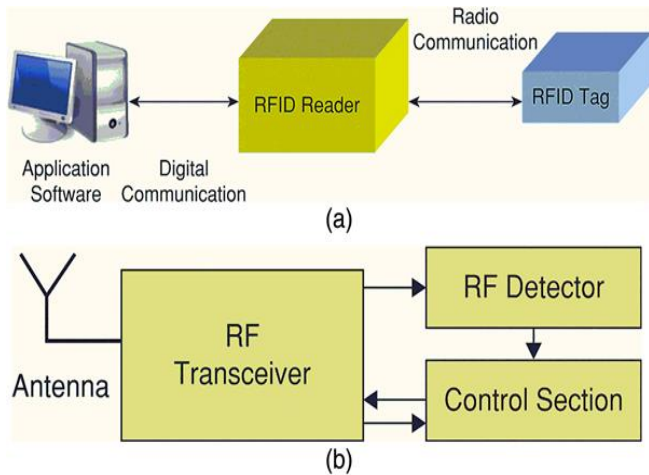


Fig -3: RFID Technology

5. IOT APPLICATIONS

5.1. Smart City Implementation Based on IOT

Recently, several native governments are reaching to implement AN IoT-based good town through the construction of a work for IoT verification And an integrated infrastructure. This movement conjointly corresponds to the artistic economy that's emphasized by the govt.

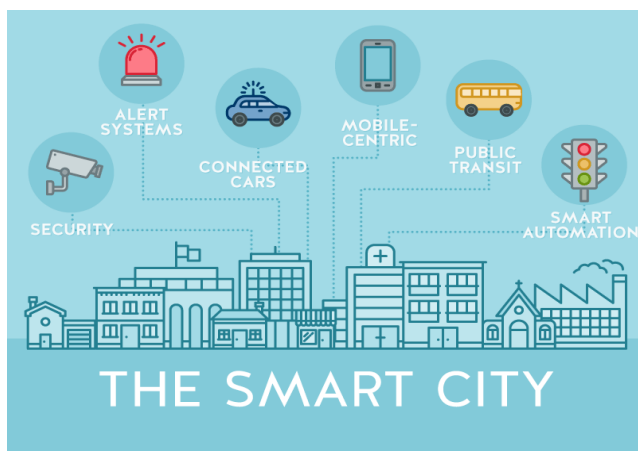


Fig -4: Smart City Using IOT

5.2. Smart Traffic Service

Major good traffic services embrace good parking services to forestall ill-gotten parking and facilitate convenient parking, subject participation-oriented ill-gotten parking bar services, and good safe crossover services, good parking refers to the development of a platform that allows period of time checking of accessible house and parking costs in areas that need parking and facilitation of reservation/payment through internet and mobile connections.

The subject participation-oriented ill-gotten parking bar service is associate improvement of the ill-gotten parking

quelling system of the traffic authority by permitting voters (including victims of ill-gotten parking) to handily report such violations through their smart phones. What is more, the good safe crossover service will contribute to the bar of pedestrian accidents and secondary automotive accidents by detective work pedestrians in kids protection zones, and alerting pedestrians and approaching vehicles through electronic show boards.

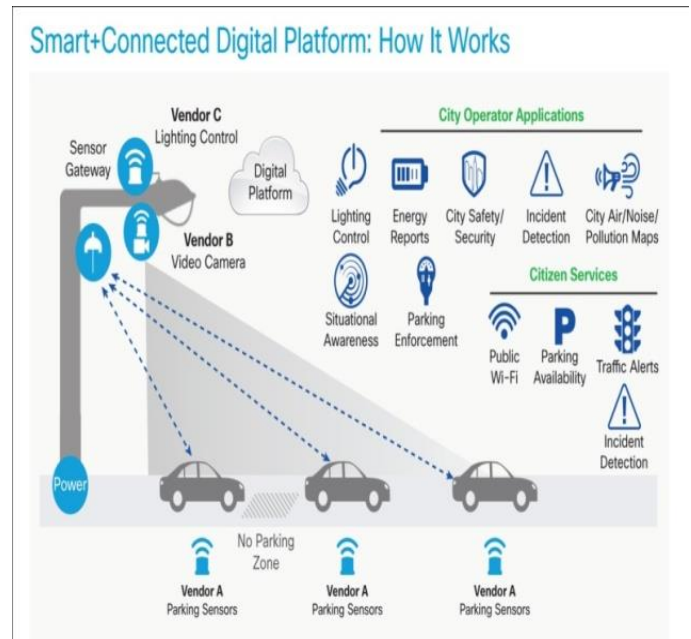


Fig -5: Smart Traffic Service

5.3. Smart Education Service

The Internet has evolved from connecting individuals and later videos, photos, and text to a lot of recently physical objects. victimization sensors, physical objects will –talk|| (transmit data) to every different and even command one another to perform a physical act. As things and folks become a lot of connected, such objects also will become a part of social networks, a lot of within the same approach that individuals tag photos on Face book. during this approach, the worth of such objects can increase for each analysis and learning. This service provides period of time, interactive high-definition lectures that desire face to-face conferences reception through high-definition (HD) services and wide-area web infrastructure. The four pillars of IoE(Internet Of Everything) produce a requirement for associate education system that empowers a brand new generation of digital voters World Health Organization perceive the technologies that underpin IoE, the social group impact of widespread adoption, and therefore the right application of the knowledge that's captured.

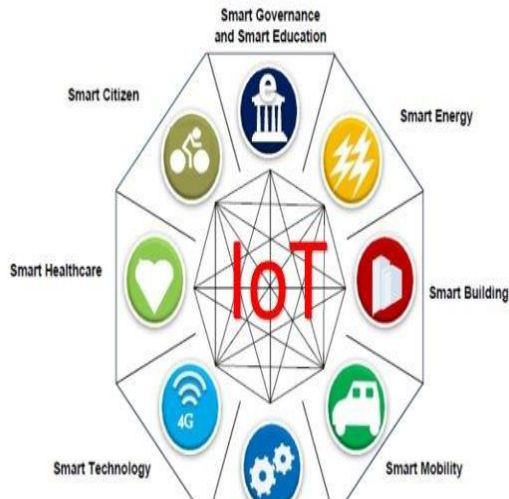


Fig -6: Smart Education Service

jointly track customers path through a store and improve store layout and place premium merchandise in high traffic areas.



Fig -8: Smart Retail

5.4.IOT in Agriculture

With the continuous increase in world’s population, demand for food supply is extremely raised. Governments are helping farmers to use advanced techniques and research to increase food production. Smart farming is one of the fastest growing field in IoT. Farmers are using meaningful insights from the data to yield better return on investment. Sensing for soil moisture and nutrients, controlling water usage for plant growth and determining custom fertilizer are some simple uses of IoT.

Future SMART Agriculture using IoT – Big PictureView



Fig -7: IOT in Agriculture

5.6.IOT in Healthcare

Connected care however remains the sleeping large of the IOT applications. The construct of connected tending system and sensible medical devices bears huge potential not only for corporations, however additionally for the well-being of individuals normally. Research shows IoT in tending are going to be huge in returning years. IoT in tending is geared toward empowering folks to measure healthier life by carrying connected devices. The collected knowledge can facilitate in personalised Analyses of an individual’s health and supply tailor created ways to combat health problem.

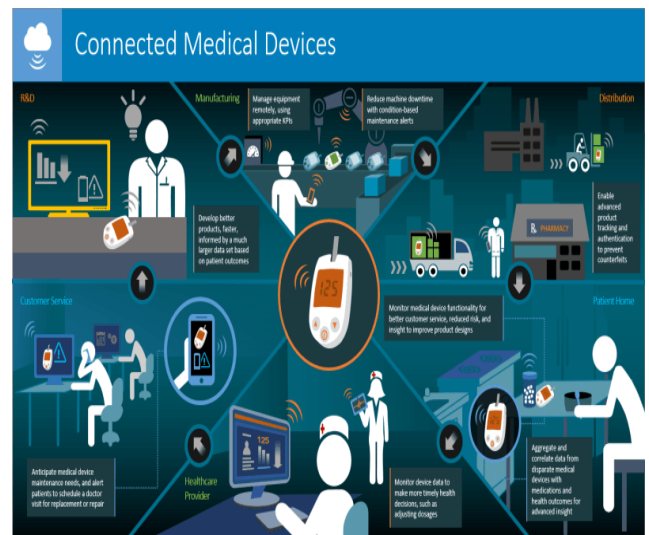


Fig -9: IOT in Healthcare

5.5. Smart Retail

The potential of IoT within the retail sector is gigantic. IoT provides a chance to retailers to attach with the purchasers to reinforce the in-store expertise.

Smartphone are the approach for retailers to stay connected with their customers even out of store. Interacting through Smartphone and mistreatment Beacon technology will facilitate retailers serve their customers higher. They will

6.CONCLUSION

This study is important in outlining general data regarding IoT, like definition, market size, and standing of IoT, that has become a hot IT topic today, and in presenting applicable IoT business models to assist business entities and analysis

institutes taking part in connected comes build a wise town as a part of the longer term vision of native governments by reflective the new data paradigm of IoT. A limitation of this study, however, is that the lack of obtainable information in peninsula that hinders the desired empirical analysis on the advantages of IoT technology. we have a tendency to hope that additional analysis during this field are conducted within the future.

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