Internet of Things Smart Applications and it's Challenges

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Abstract— Internet of Things is gaining a great attention from researchers nowadays. It is becoming an important technology that promises for smart life of human. It allows objects, machines and every things to communicate together with peoples.IOT represents a system that consists of sensors that are attached to things in the real world such as living or non living, and they are connected to internet using wired or Wi-Fi Network. We can connect IOT sensors using various types of connections such as RIFD, Bluetooth, ZigBee in addition to WAN technologies such as GSM,GPRS and 4G etc.,. IOT enabled devices are called as smart machines. The devices share information about their conditions and their environment with the people. People can know information about their things and use in a single click. By the usage of IOT enabled machines our world will become smart in all aspects.

Keywords-Internet of things, smart machines, Wi-Fi Network

1. INTRODUCTION

The internet of things, or IoT, is an arrangement of interrelated registering gadgets, mechanical and computerized machines, articles, creatures or individuals that are furnished with interesting identifiers (UIDs) and the capacity to exchange information over a system without expecting human-to-human or human-to-PC collaboration[2].

IoT refers to an Internet Of Things(IoT). Connecting any device (including everything from cell phones, vehicles, home appliances and other wearable embedded with sensors and actuators) with Internet so that these objects can exchange data with each other on a network. It is interesting to note that there is a difference between IoT and the Internet, it is the absence of Human role. The IoT devices can create information about individual's behaviors, analyze it, and take action. IoT is much smarter than Internet[3].

Internet of Things represents a general concept for the ability of network devices to sense and collect data from the world around us, and then share that data across the Internet where it can be processed and utilized for various interesting purposes. Some also use the term industrial Internet interchangeably with IoT. This refers primarily to commercial applications of IoT technology in the world of manufacturing. The Internet of Things is not limited to industrial applications, however it can be used in all aspects of our livelihood[4].

The Internet of Things (IoT), as this intelligent interconnectivity between the real and the digital world is called, will rapidly transform every aspect of how we work and do business. By connecting apps with their integrated systems, businesses are able to transform their industry significantly: today almost 90% of all data generated by tablets, smart phones or connected appliances is never acted upon. Imagine you could change that. Image you could use those data to create intelligent tools and interconnected systems or services that will allow you to optimize and accelerate your business processes. It seems safe to say that we have never encountered a single technological platform that combines this much complexity, global reach and novelty.[4]



Fig. 1. Internet of Things Concepts and Applications

2. IOT APPLICATIONS

IOT is used mostly in all aspects of our day to day life. IOT is a technology which has been developed to make the life of our humans more smart and very intelligent Some important applications of IOT are stated here.

Smart Home

Smart Home clearly stands ranking out. as highest web of Things application on all measured channels. Quite sixty thousand individuals "Smart Home" every presently seek for the term month. This is often not a surprise. The IoT Analytics company information for sensible Home includes about 256 corporations startups. Additional corporations area unit active in sensible home than the

other application within the field of IoT. the entire quantity of funding for sensible Home startups presently exceeds \$2.5bn[5].

Wearables

Wearables remain a hot subject matter too. Wearable devices are mounted with sensors and software which gather records and data about the customers. This facts is later pre-processed to extract important insights approximately person. These devices extensively cover fitness, fitness and entertainment necessities. The pre-requisite from net of factors technology for wearable packages is to be exceedingly power efficient or extremely-low strength and small sized.

Smart Cities

Smart metropolis is every other powerful software of IOT generating curiosity amongst world's population. Clever surveillance, computerized transportation, smarter energy control structures, water distribution, urban security and environmental tracking all are examples of internet of factors packages for smart cities.

IOT will solve major troubles confronted via the humans dwelling in cities like pollution, traffic congestion and absence of energy resources and many others. products like cellular conversation enabled clever stomach trash will ship signals to municipal offerings while a bin desires to be emptied.

By putting in sensors and the use of web programs, residents can discover loose available parking slots across the town. Also, the sensors can come across meter tampering problems, general malfunctions and any set up troubles inside the electricity gadget[6].

IOT in Agriculture

With the continuous growth in global's populace, demand for meals deliver is extremely raised. Governments are supporting farmers to use advanced techniques and research to growth meals production. clever farming is one of the fastest growing field in IoT. Farmers are using meaningful insights from the records to yield higher go back on investment. Sensing for soil moisture and vitamins, controlling water utilization for plant growth and determining custom fertilizer are a few simple makes use of of IoT[7].

Health Care

IOT programs can turn reactive scientific-based totally systems into proactive wellbeing-primarily based structures. The resources that cutting-edge scientific research uses, lack crucial real-international information. It normally uses leftover information, controlled environments, and volunteers for scientific examination. IoT opens ways to a sea of precious statistics through evaluation, actual-time area data, and trying out. The internet of things additionally improves the present day gadgets in strength, precision, and availability. IoT focuses on developing structures as opposed to just gadget[8].

Industrial Automation

This is one of the fields wherein each faster trends, as well as the first-class of products, are the essential factors for a higher go back on funding. With IoT applications, one ought to even re-engineer products and their packaging to deliver better overall performance in each fee and consumer experience. IoT right here can show to be recreation changing with answers for all of the following domains in its arsenal. In only 1-12 months internet related gadgets went from five million to billions. business Insider Intelligence estimates that 24 billion IoT gadgets could be hooked up by way of the year 2020, generating a sales of over three hundred billion[8].

Smart factory integrates machine learning, artificial intelligence and automation of work knowledge and machine to machine communication with in the manufacturing process [9].

Smart Grids

Smart grids are another location of IoT technology that stands out. A clever grid essentially promises to extract information at the behaviors of consumers and energy suppliers in an automatic style to improve the performance, economics, and reliability of energy distribution. 41,000 month-to-month Google searches is a testament to this concept's popularity [10].

Wearables

Connected car technology is a vast and an extensive network of multiple sensors, antennas, embedded software, and technologies that assist in communication to navigate in our complex world. It has the responsibility of making decisions with consistency, accuracy, and speed. It also has to be reliable. These requirements will become even more critical when humans give up entirely the control of the steering wheel and brakes to the autonomous or automated vehicles that are being successfully tested on our highways right now [11].

Medical field

Provides Assistance for elderly or disabled people who are living independent. It Monitors and Controls the of conditions inside freezers storing medicines, vaccines, and organic elements. Vital signs monitoring in high performance centers and fields. Monitoring of patients conditions inside hospitals and in old people's home. Measurement of UV sun rays to warn people not to be exposed in certain hours[12].

Smart Environment

Environment plays a major role in the life of humans. Unhealthy environment affects all living things. Many researchers have been carried out to solve pollution problems [13]. Creation of healthy environment is not so easy due to large amount of industrial and transportation wastes and also due to lack of human awareness[14].To track sense and monitor the objects of the environment Iot technology is developed which help us to achieve the benefits of green world and sustainable life[15].Iot can also be used in measuring emission levels of factories and also able to detect forest fires[16].

3. IOT APPLICATIONS

The fact that internet of things packages and situations mentioned above are very exciting which offers technologies for smart every matters. However there are some demanding situations to the application of the internet of things concept in cost of implementation. The expectation that the technology need to be to be had at low value with a big wide variety of gadgets. With the features IOT faces many challenges too.

Scalability

Internet of things has a massive concept than the traditional internet of computer systems, because of matters are cooperated inside an open environment. Basic capability which includes conversation and carrier discovery therefore need to function similarly effectively in both small scale and large scale environments. The IOT calls for a new functions and techniques to be able to benefit an efficient operation for scalability.[17,18]

Security

Safety is an vital pillar of the internet and one which ISOC perceives to be equally important and the most tremendous mission for the IOT. Increasing the quantity of related gadgets will increase the opportunity to exploit security vulnerabilities, as do poorly designed gadgets, that can expose user information to theft by means of leaving facts streams inadequately covered and in a few instances people's fitness and protection (implanted, net-enabled clinical gadgets and hackable cars) may be put at hazard.

Self Organizing

clever things ought to no longer be managed as computers that require their users to configure and adapt them to particular situations. Cellular matters, which might be

frequently most effective sporadically used, need to establish connections spontaneously, and capable of be arrange and configure themselves to match their particular surroundings

Data Volumes

some application scenarios of the internet of factors will contain rare communication, and amassing facts's form sensor networks, or shape logistics and huge scale networks, will accumulate a big volumes of records on central network nodes or servers. The term constitute this phenomena is huge information which is requires many operational mechanism similarly to new technology for storing, processing and control.

Data Interpretation

To guide the users of clever matters, there is a need to interpret the local context decided with the aid of sensors as as it should be as possible. For provider companies to take advantage of the disparate records with a purpose to be generated, wishes on the way to draw a few generalizable conclusions from the interpreted sensor information.

Privacy

The IoT creates unique demanding situations to privacy, many who move beyond the records privacy issues that currently exist. a great deal of this stems from integrating gadgets into our environments without us consciously the use of them.

Interoperability

Every form of smart devices in internet of things have distinct facts, processing and verbal exchange skills. Special smart objects might also be subjected to different conditions along with the power availability and the communications bandwidth requirements. To facilitate verbal exchange and cooperation of these gadgets, not unusual requirements are required.

Automatic Discovery

In dynamic environments, suitable offerings for things must be robotically identified, which requires appropriate semantic means of describing their functionality.

Fault Tolerance

objects in internet of factors is much greater dynamic and cellular than the internet computers, and they are in changing swiftly in sudden methods. Structuring a web of things in a strong and truthful way would require redundancy on numerous ranges and an potential to robotically adapt to modified situations.

4. CONCLUSION

Internet of things is a technology which allows things to things communication and human to things communication through internet by using many application that it provides. By using IOT we can identify each object and connect them using internet and make them take decisions independently. For building the IOT concept many technologies such as mobile computing, RIFD, wireless sensor networks and embedded system are used. And also many algorithms and methodologies are used for several purposes such as processing storing and security issues. By internet of things many smart applications become real in our life. IOT makes us feel comfort in all aspects of our real life. It also faces some challenges due to size of data and address restriction, security issues etc., By using the ongoing technologies IOt can tackle all those challenges. This paper surveys some important applications of IOT with other major challenges that are faced while implementing this internet of things concept.

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