Project Name

Describe IOT with application and technology

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Abstract: -

We are entering a new era of computing technology that many are calling the Internet of Things (IoT). Machine to machine, machine to infrastructure, machine to environment, the Internet of Everything, the Internet of Intelligent Things, intelligent systems—call it what you want, but it's happening, and its potential is huge.

We see the IoT as billions of smart, connected "things" (a sort of "universal global neural network" in the cloud) that will encompass every aspect of our lives, and its foundation is the intelligence that embedded processing provides.

huge volumes of data are being generated, and that data is being processed into useful actions that can "command and control" things to make our lives much easier and safer—and to reduce our impact on the environment.

Describe IOT

The Internet of Things (IoT) has appeared as the Internet's next big thing.
Via heterogeneous access networks enabled by technologies such asembedd edsensing and actuating, radio frequency identification (RFID), wireles sensor networks, it is imagined that billions of physical things orartifacts would be inst alled
with different sensors and actuators and connected to the Internet,
Actuators and Internet-
connected, online services in real time and semantic, etc. In reality,

The IOT is a network of networks or cyberphysical structures. With the enormous nu mber of Internet connected things/objects and sensors, connected things and sensors can automatically create a huge and often real -time data flow.

It is necessary to efficiently collect the right raw data; but it is more important t o analyze and mine the raw data in order to abstract more useful information, such a connections between objects and services to provide the web of things or the Internet of services [1]

The Important of the IOT.

Over the past few years, the IoT has been one of the most significant 21st century inventions.
Now that everyday items, such as kitchen appliances, vehicles, the rmostats,
baby monitors, can be linked to the internet through embedded devices, seamless communication between people, processes and stuff is possible.
With minimal human interference, physical things can exchange and coll ect data
through low-cost computing, the cloud, big data, analytics,
and mobile technologies. Digital systems can log, track, and adapt each interaction between connected objects in this hyperconnected world.The re al world interacts, and they cooperate, with the digital world. [2]

Internet of Things: Network Architecture, Device Structure, and Applications

Figure 1 offers a generic view of the design of an IoT network using vari ous
wireless technologies. For proper operation and data transfer, various IoT components are connected to the 3GPP network components.
he architecture in Figure 1 also describes a kind of capillary architecture of the network. In which all the devices switch their collected components
Data through an intermediate entity that is an IoT gateway to the IoT ser ver. where IoT devices and networks are being used for applications like structural health monitoring, environmental monitoring, human health monitoring, traffic monitoring, smart homes appliances, and so on. [3]

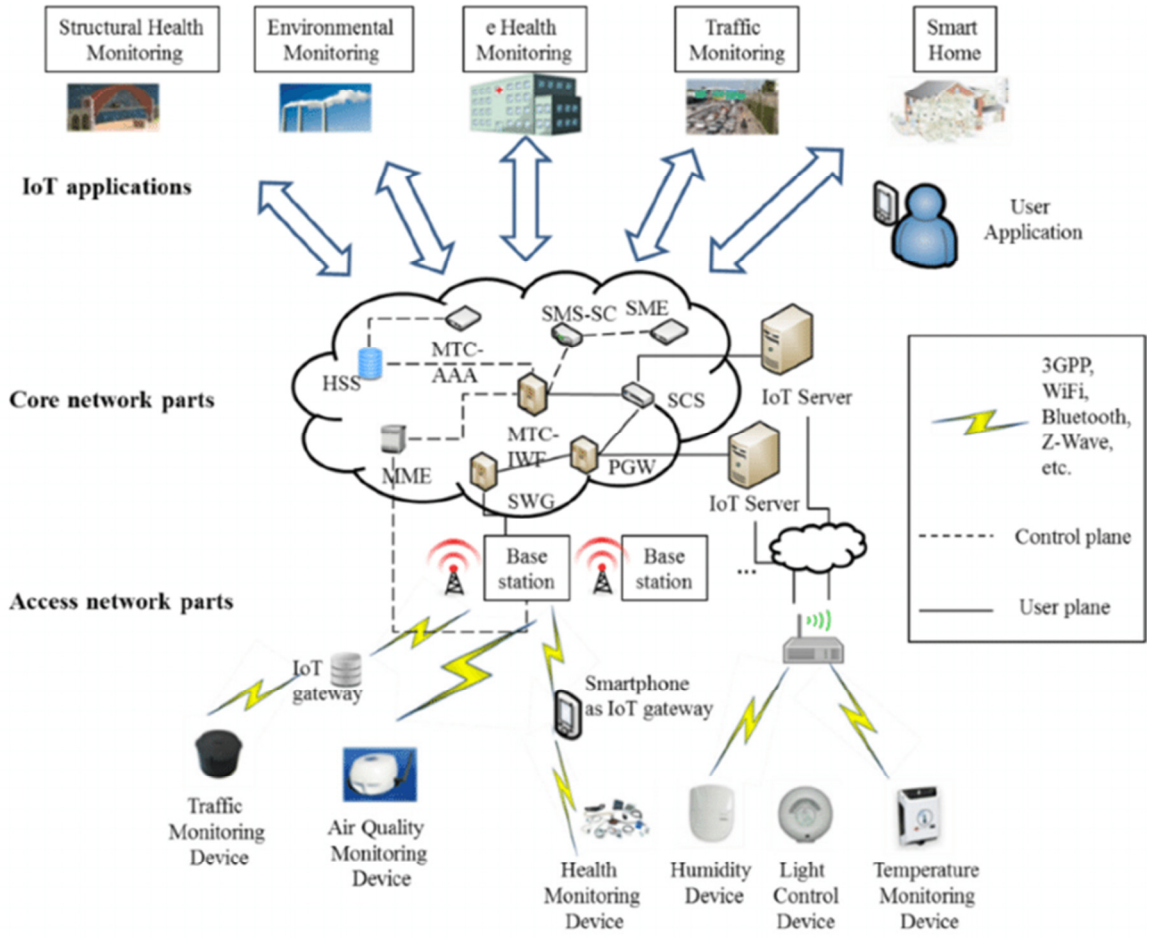

Figure 1. A generic Internet of Things (IoT) network architecture.

IOT Characteristics

Interconnectivity: With respect to the IoT, the global knowledge and communic ation system can be interconnected with everything.[4]

Heterogeneity: The devices in the IoT, based on various hardware platforms a nd networks, are heterogeneous. Via various networks, they may communicate with other devices or service platforms .[4]

Dynamic changes: The state of devices, such as sleeping and waking up, connected and/or disconnected, and the context of devices, including location and s peed, change dynamically. The number of devices, in addition, can change dynamically.[4]

Enormous scale: At least an order of magnitude greater than the devices connected to the current Internet would be the amount of devices that need to be handled and that communicate with each other.
Compared to communication triggered by humans, the proportion of communication triggered by devices would change significantly towards communication triggered by devices.[4]

IOT Application

In a range of core European industrial sectors, IoT technologies are expected to promote innovation, Factory automation/smart manufacturing, clean energy, mobility, like healthcare and wellness, Production and distribution of food, surveillance of the environment, houses, living conditions, wearables, Intelligent towns, etc.
This section gives an overview of the areas of application addressed, as[5]

1-Health

The use of patient connected wearables or sensors helps doctors to monitor the condition of a patient outside the hospital and in real-time.
The Internet of Things aims to improve patient safety and the avoidance of lethal incidents in highrisk patients by constantly tracking those metrics and automatic updates on their vital signs.
Another use is the integration of IoT technology into hospital beds, giving way to smart beds, equipped with special sensors to observe vital signs, blood pressure, oximeter and body temperature, among others.[6]

2-Smart home

With the hype generated by IoT,' Smart Home' is the most searched feature associated with IoT on Google.
What is a Smart House, though?
If you could turn on air conditioning before you reach home or switch off lights even after you leave home, wouldn't you love it? Or open the doors for temporary access to friends or when you're not at home. Don't be shocked that businesses are building goods to make your life easier and more comfortable with the IoT taking shape.The groundbreaking ladder of success in residential spaces has become Smart Home, and it is expected that smart homes will become as popular as smartp

hones.The cost of buying a house is the greatest expense in the life of ahomeowner. To save time, energy and money, Smart Home products are promised. To name a few, Smart Home companies such as Nest, Ecobee, Ring and August will become household brands and aim to offer an experience never seen before.[7]

3- Smart Environment and Agriculture

For agricultural production, environmental parameters, such as temperature and humidity, are important. Sensors are used to calculate certain parameters by farmer's in the field and this data can be used for efficient production.
Automated irrigation according to weather conditions is one application.
Today, air pollution is an important problem because it is affecting the earth's atmosphere and degrading the quality of air. A lot of air pollution is caused by cars. To monitor air pollution, electrochemical sensors for harmful gases may also be used. RFID tags mark cars. Along with the gas sensors, RFID readers are mounted on both sides of the lane. It is possible to classify and take action against polluting vehicles through this method.[8]

Blockchain for IoT Security

What's Technology for Blockchain? The modern Internet, is it?
Blockchain is a technology that can be used by a person or a business without the need for any intermediaries to make instant transactions on a network.
This is much like how it works at a financial bank.
The transactions carried out on the blockchain are completely secured.
The powerful computer codes that are used in Blockchain ensure that no transaction record can be changed.Many financial & governmental institutions, developers, customers, and industrialists have used blockchain technology.
This is one of the most common IoT developments in the field of technology that will bring great differences and encourage its advanced application to create technological devices.[9]

5G impact on Iot

On the rise is the Internet of Things (IoT). By 2023, the number of connected devices is expected to grow from 700 million to 3.2 billion. Although there are a variety of factors leading to this increase, the creation of 5G networks would be one of the most important.
For the IoT market, the forthcoming introduction of the fifth generation of wireless mobile communications or 5G is excellent news. This is mostly because 5G networks are going to go a long way towards enhancing the efficiency and reliability of these connected devices.
The commercial success of any IoT is ultimately tied to its performance, which is dependent on how quickly it can communicate with other IoT devices, smartphones and

tablets, software in the form of its app or website, and more. With 5G, data-transfer speeds will increase significantly.

5G would be 10 times faster than the existing LTE networks, according to rumors. This speed boost will allow IoT devices to communicate and exchange data faster than ever before.For example, when it comes to smart home appliances, this increase in speed helps to minimize latency and boost the overall speed at which data and alerts are sent and received by connected devices.
Almost all IoT devices will benefit from faster speeds, including those with healthcare and industry applications, in addition to smart home devices.[10]

The Enabling Technologies of the Internet of Things

BIG DATA

When more items (or "smart objects") are linked to the IoT, more information is gathered from them to conduct analytics to evaluate trends and associations leading to insights.The fact that IoT systems must deal not only with data obtained from smart objects, but also with ancillary data that is needed, further compounds the technological challenges of big data.
To execute those analytics correctly (e.g., public and private data sets related to weather, GIS, financial, seismic, map, GPS, crime, etc.).
Thus, as more smart objects come online, IoT operators usually use at least three metrics ("the three V's") to characterize the
big data they handle: volume (i.e. the amount of data they receive from their IoT sensors measured in gigabytes, terabytes and terabytes).velocity (i.e., the speed at which data is collected from the sensors); and variety (i.e., the di erring types of structured and unstructured data collected, especially when compared to video and picture files as is typical within the consumer Internet).[11]

Cloud

Two definitions are given to cloud computing. The most popular refers to operating workloads in the data center of a commercial provider, often referred to as the "public cloud" model, remotely over the internet. This familiar definition of cloud computing is exemplified by popular public cloud offerings, such as Amazon Web Services (AWS), Salesforce's CRM framework, and Microsoft Azure. Most organizations today take a multi cloud approach this basically
implies that they are using more than one public cloud service.
Cloud computing's second definition explains how it works: a virtualized pool of

resources that are accessible on demand, from raw computing capacity to application features. The provider fulfills those demands using advanced automation rather than manual provisioning as customers procure cloud services.
Agility is the main benefit: the ability to apply abstract computing, storage, and network resources to workloads as necessary and tap into an abundance of pre-built services.[12]

Cloud computing definitions for each type

SaaS (software as a service)

Via the browser, this form of public cloud computing delivers applications over the internet. The most popular business SaaS applications can be found in Google's G Suite and Microsoft's Office 365; Salesforce leads the pack among enterprise applications. Virtually all enterprise software, however,The SaaS model has been adopted, including ERP suites from Oracle and SAP.
SaaS applications usually provide robust configuration options as well as development environments that allow clients to code their own improvements and additions.[12]

IaaS (infrastructure as a service)

IaaS public cloud providers provide storage and computing facilities on a pay-per-use basis at the basic level. Yet all major public cloud providers provide a wide range of services: highly elastic databases, virtual private networks, etc.Big data analytics, software for developers, machine learning, tracking applications, and so on. Amazon Web Services, preceded by Microsoft Azure, Google Cloud Platform, and IBM Cloud, was the first IaaS provider and remains the leader.[12]

Conclusion

huge volumes of data are being generated, and that data is being processed into useful actions that can “command and control” things to make our lives much easier and safer—and to reduce our impact on the environment. big data and cloud computing can provide new opportunities and applications in all the sectors like Smart home, heath in future use the block chain and 5g impact on IOT.

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