



IoT Based Technology Trends: A Review Paper

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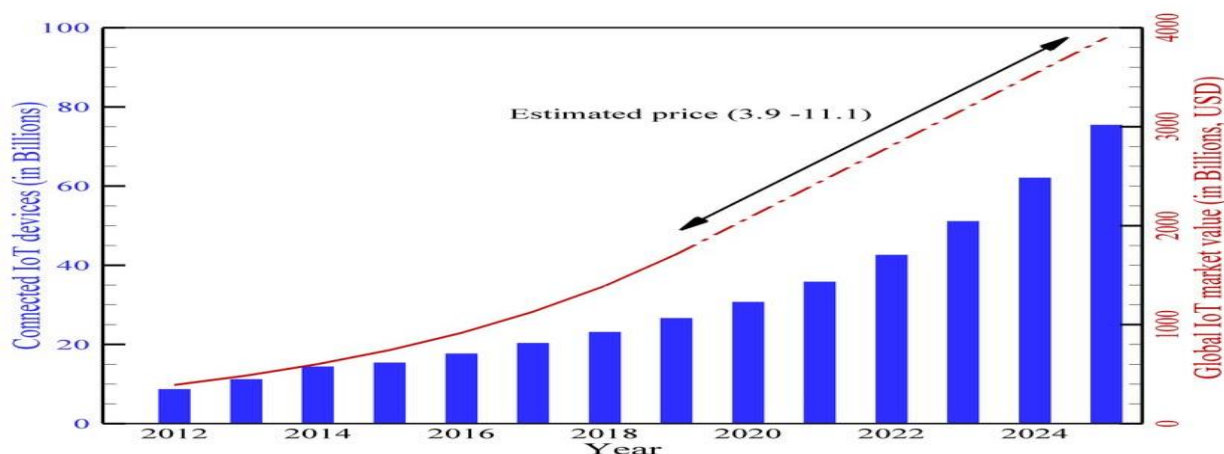
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Abstract: Internet of factors (IOT) is a brand new paradigm that has modified the conventional manner of residing into a high tech life fashion. Smart metropolis, smart houses, pollutants control, power saving, smart transportation, smart industries are such transformations because of IOT. The quick improvement within the area of communications and semiconductors has brought about increasing the internet of things (IOT) packages utilized in all areas of life (along with industry, agriculture, transportation, health, and smart cities). The purpose of this paper is to tell the new technology in IOT

Keywords: IOT, Artificial Intelligence, distributed cloud, everything as a service, voice as user interface.

INTRODUCTION

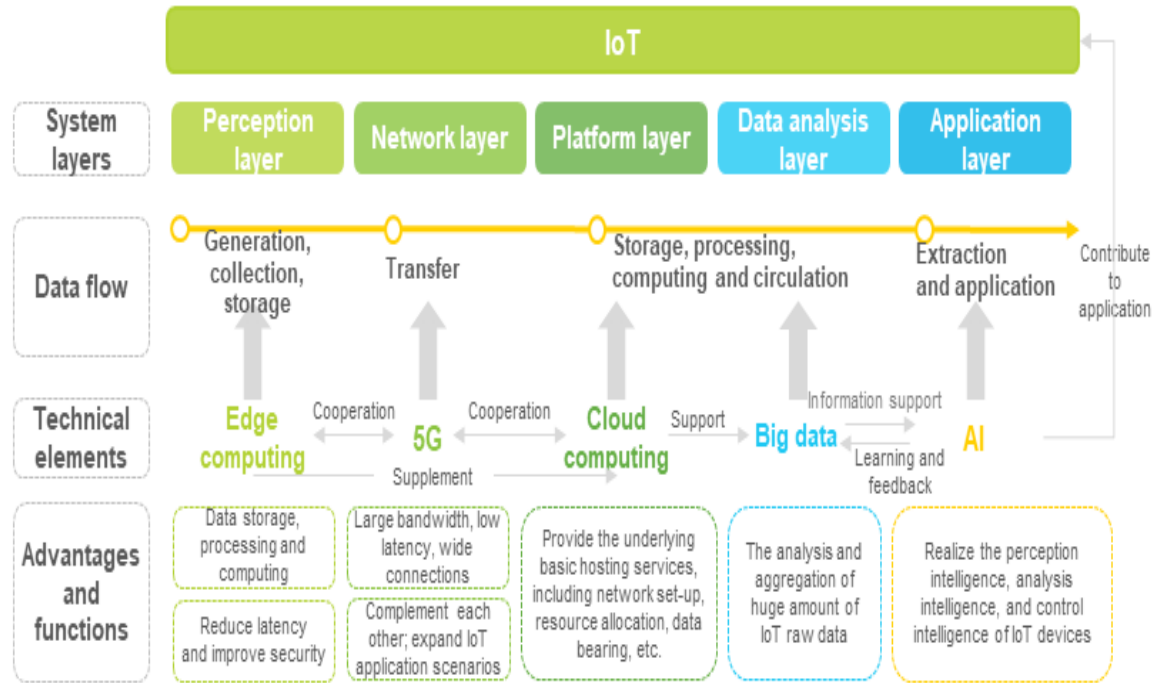
The net of factors, normally referred as IOT is an ubiquitous concept wherein physical gadgets are connected to the net and feature an potential to speak over a network, additionally, may be defined the IOT is a system of physical items that may be discovered, monitored, managed, or interacted with by digital devices that speak over diverse networking interfaces and in the end may be connected to the wider internet .Such networked gadgets or things are referred as IOT gadgets and are deployed universally.



There are many devices that are connected with the IOT devices.

Architecture of IOT

Relationships between the IoT and Various Technologies



Source: Public information. The research and chart are done by iResearch independently.

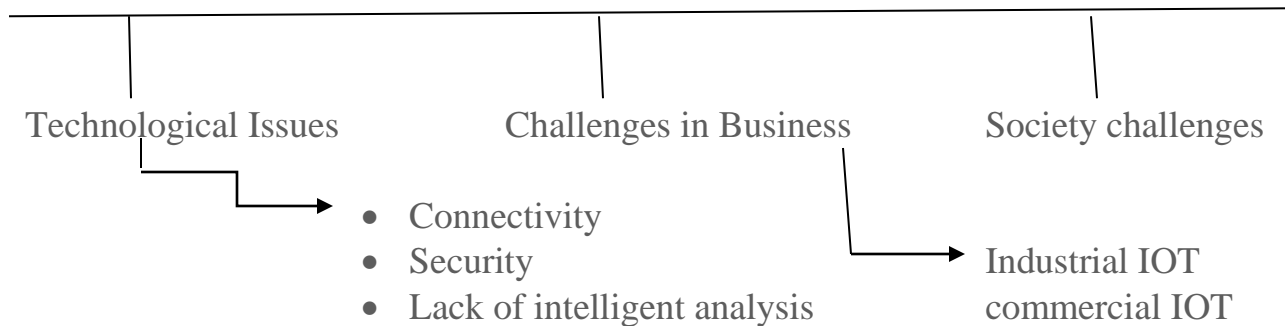
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Challenges in IOT

There are many challenges in IOT.

Even with the big usage of IOT, it is still facing issues that need to be resolved.



Technology Buzzwords 2022



Distributed Cloud



Quantum Computing



Artificial Intelligence



Cybersecurity Mesh



Everything as a Service



Voice-as-User Interface



Hyperautomation



Cloud-Native Platforms



Extended Reality (XR)



Multiexperience

 datapine

Distributed Cloud:

A distributed cloud is an structure wherein more than one clouds are used to satisfy compliance desires, overall performance requirements, or aid side computing at the same time as being centrally managed from the general public cloud company.

- In essence, a allotted cloud provider is a public cloud that runs in a couple of places, together with the public cloud issuer's infrastructure.
- The general public cloud company's infrastructure.
- In another cloud company's records middle.
- On third party center hardware.

Through cloud computing, a client can request information, shared resources, software and other services at any time, according to his specifications. It is an on-demand service, and the term is commonly seen across the internet. You can view the whole internet as a cloud. Not to mention, utilizing cloud decreases the capital and operational costs. However, a major challenge in cloud computing is load balancing, a distributed solution to this issue is always required. Because of the complexity of cloud and widespread distribution of its component, it is difficult to have efficient load balancing by assigning jobs to appropriate servers and clients individually, and it is not cost effective or practical fulfilling the required demands by maintaining one or more idle services. While jobs are assigned, some uncertainty is attached [1]

How does a distributed cloud work?

In a distributed cloud, offerings are positioned or 'disbursed' to specific locations to reduce latency and these offerings experience a single, consistent manage area throughout public and personal cloud environments. Gartner states that organization can see primary performance gains through decreasing latency and lowering the can deliver fundamental enhancements in performance due to the elimination of latency issues, lowering standard risk of outage or control plane inefficiencies.

A distributed cloud takes not simply an utility however the entire computing stack and distributes it to the locations in which it's miles wished, whether public cloud provider, on-premises, or in third party collocation facility. The ingesting cloud client sees this distributed infrastructure as a single cloud entity, and the cloud company manages all of the factors of the distributed cloud as an entire from a single manage plane.

The public cloud issuer remains liable for all cloud operations, together with security, availability, updates, and governance of the entire allotted infrastructure. To paraphrase Gartner, distributed cloud fixes what hybrid cloud and multi-cloud breaks.

Quantum Computing

Quantum computing is a rapidly-emerging technology that harnesses the laws of quantum mechanics to solve problems too complex for classical computers.

Today, IBM Quantum makes real quantum hardware -- tool scientists only began to imagine three decades ago -- available to thousands of developers. Our engineers deliver ever-more-powerful superconducting quantum processors at regular intervals, building toward the quantum computing speed and capacity necessary to change the world.

In digital computers all information is reduced to a sequence of bits and all computations are done through logic gates. The digital computer's state is determined by the state of its bits, so a computer with n states can exist in one of 2^n possible states. A quantum computer also has bits, but instead of 1's and 0's, the quantum bit can represent both a linear combination of 1 and 0 at the same time, and this is known as superposition [2]

How do quantum computers work?

Quantum computers are elegant machines, smaller and requiring less energy than supercomputers. An IBM Quantum processor is a wafer not much bigger than the one found in a laptop. And a quantum hardware system is about the size of a car, made up mostly of cooling systems to keep the superconducting processor at its ultra-cold operational temperature.

A classical processor uses bits to perform its operations. A quantum computer uses qu bits (CUE-bits) to run multidimensional quantum algorithms.

Super fluids:

Your desktop computer likely uses a fan to get cold enough to work. Our quantum processors need to be very cold – about a hundredth of a degree above absolute zero. To achieve this, we use super-cooled super fluids to create superconductors.

Superconductors

At those ultra-low temperatures certain materials in our processors exhibit another important quantum mechanical effect: electrons move through them without resistance. This makes them "superconductors." When electrons pass through superconductors they match up,

forming "Cooper pairs." These pairs can carry a charge across barriers, or insulators, through a process known as quantum tunneling. Two superconductors placed on either side of an insulator form a Josephson junction.

Control:

Our quantum computers use Josephson junctions as superconducting qubits. By firing microwave photons at these qubits, we can control their behavior and get them to hold, change, and read out individual units of quantum information.

Superposition

A qubit itself isn't very useful. But it can perform an important trick: placing the quantum information it holds into a state of superposition, which represents a combination of all possible configurations of the qubit. Groups of qubits in superposition can create complex, multidimensional computational spaces. Complex problems can be represented in new ways in these spaces.

Entanglement

Entanglement is a quantum mechanical effect that correlates the behavior of two separate things. When two qubits are entangled, changes to one qubit directly impact the other. Quantum algorithms leverage those relationships to find solutions to complex problems.

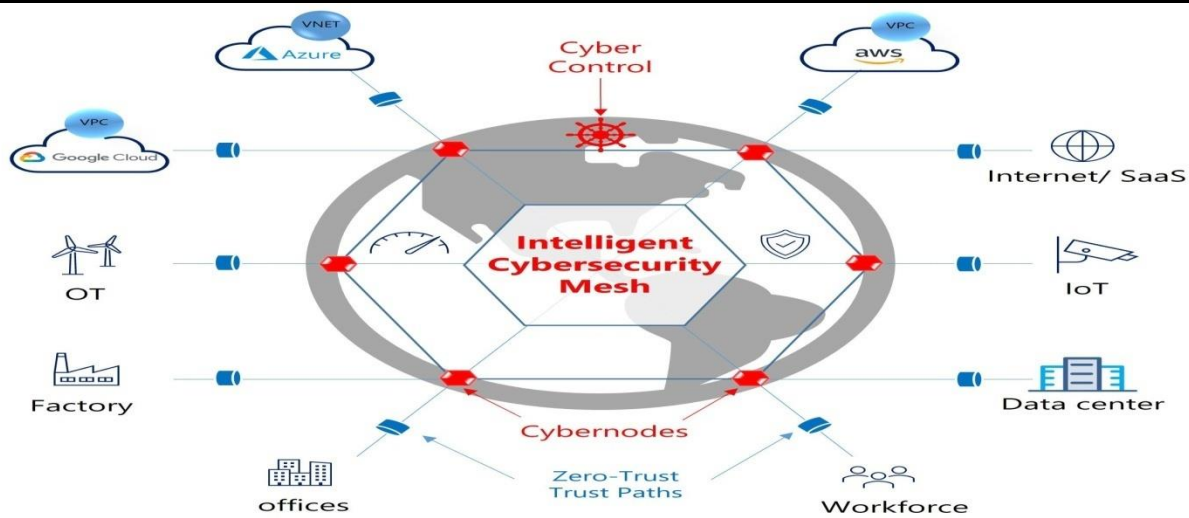
Everything as a Service (XaaS) :
Everything as a Service (XaaS) means anything can now be a service with the help of cloud computing and remote accessing. Where cloud computing technologies provide different kinds of services over the web networks. In everything as a Service, various tools and technologies, and services are provided to users as a service. Before XaaS and cloud services, companies have to buy licensed products and install them, had to all securities on their site and provide infrastructure for business purposes. With XaaS, business is simplified as they have to pay for what they need. This Everything as a Service is also known as Anything as a Service. [3]

Examples of XaaS : As XaaS stands for "Everything as a service", There are many examples. There are many varieties of cloud computing models like –

1. Software as a Service (SaaS)
2. Platform as a Service (PaaS)
3. Disaster Recovery as a Service (DRaaS)
4. Infrastructure as a service (IaaS)
5. Communication as a Service (CaaS)
6. Network as a Service (NaaS)
7. Desktop as a Service (DaaS) etc.

Cyber Security as a mesh

In the past decade, technology use has increased commendably, and now enterprises rely upon IOT devices, cloud technology, remote workers, internet, and so on. An effective method, called Cyber security mesh technology, covers the safety of all. It involves using security practices wherever and whenever it's needed. In simple words, this cloud security method that focuses on creating a flexible security-oriented architecture that utilized safety or risk-mitigation arrangements without causing any delay. Its scope could include distributed systems/components and much more.



Cloud native platform

A *native application* is one that has been developed for use on a specific platform or device, and executes more quickly and efficiently because it makes maximum use of the capabilities built into (i.e. native to) that platform or device, and doesn't require any extra layers of translation or interface to run there. Thus, we see the terms "native iOS app" and "native Android app" used to refer to mobile apps whose software code is written just for Apple's iOS or Google's Android operating system.

Extended Reality (XR)

Extended Reality (XR) is a fusion of all the realities – including Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR) – which consists of technology-mediated experiences enabled via a wide spectrum of hardware and software, including sensory interfaces, applications, and infrastructures.

XR is often referred to as immersive video content, enhanced media experiences, as well as interactive and multi-dimensional human experiences.

"XR does not refer to any specific technology. It's a bucket for all of the realities."

Jim Malcolm, Humaneyes

Multi experience

Multi experience is about creating a seamless user experience, with one application, across a variety of digital touch points: websites, mobile apps, chatbots, augmented reality/virtual reality (AR/VR), and wearables.

Hyper automation

Hyper automation involves the application of advanced technologies, including AI and machine learning, to increasingly automate processes and augment humans. Hyper automation extends across a range of tools that can be automated, but also refers to the sophistication of the automation.

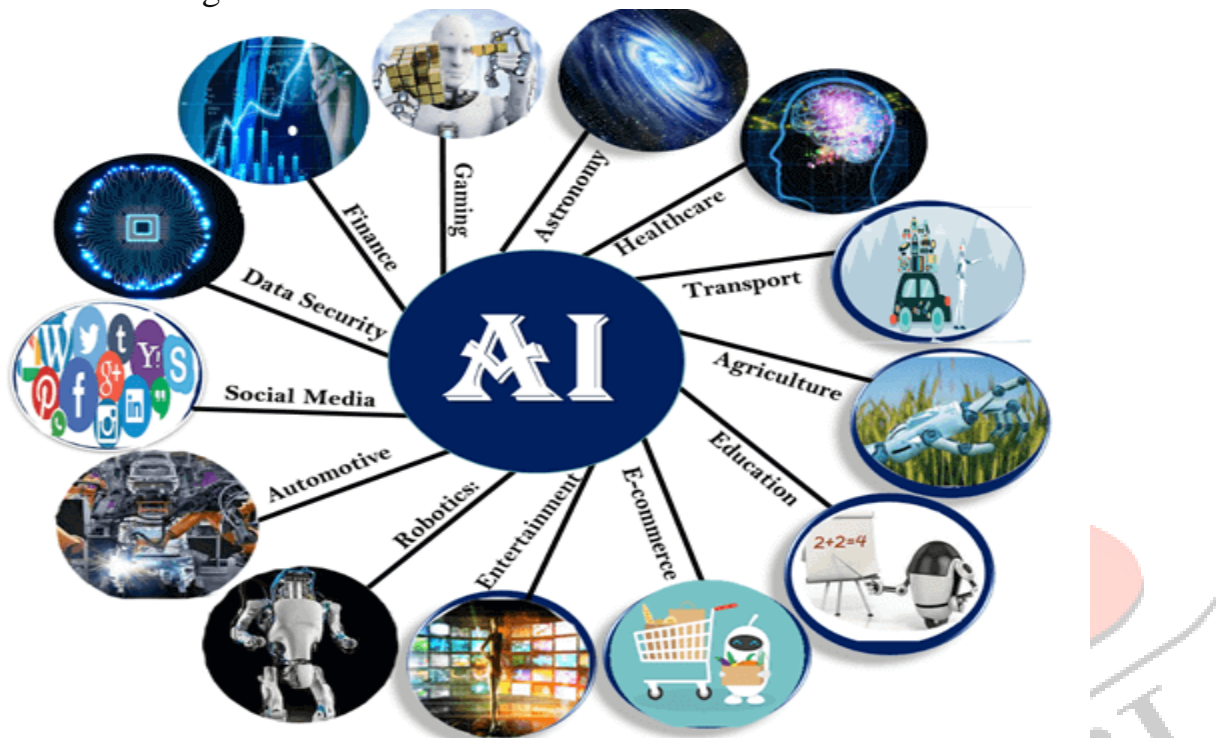
Hyper automation is the new technological phenomenon in which it can bring intelligent automation processes using Robotic Process Automation (RPA), Artificial Intelligence (AI), Machine Learning (ML) and other technologies. It has a good amount of business applications; that is why many tech giants and start-ups are putting huge investments to reap the fruits of Hyper automation.

Voice user interface

Voice user interface (VUI) is speech recognition technology that allows people to interact with a computer, smartphone or other device through voice commands. Apple's Siri, Amazon's Alexa, Google's Assistant and Microsoft's Cortana are prime examples of VUIs.

Artificial Intelligence

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving.



Conclusion: In era of 2022 there are many new inventions . IOT thing will turn into web of things and will impact every aspect of our life. Internet of things used in healthcare, medicine, robotics car, education and IOT is used in smart cities, smart building, traffic monitoring security and emergencies.

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