



An Analysis of Emerging IOT Trends In 2024

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ABSTRACT

Human beings' quest for making comfortable life is due to their inquisitiveness about technical arena. Over the last few decades, mankind had experienced technical transformational journey with the inventions of new technology frontiers. These frontiers have interacted with human beings and performed every possible work in shorter period of time and with a much greater accuracy. With the advent of 'Smart Concepts', the world is now becoming more connected. Precisely termed as hyper-connected world. The smart concepts include smart phones, smart devices, smart applications and smart cities. These smarter concepts form an ecosystem of devices whose basic work is to connect various devices to send and receive data. Internet of Things is one the dominating technology that keeps eye on the connected smart devices. Internet of Things has brought applications from fiction to fact enabling fourth industrial revolution. The IoT paradigm describes communication not only human to human (H2H) but also machine to machine (M2M) without the need of human interference. IoT continues to influence our lives and has changed our way of living into a high-tech lifestyle. But what is the future of IoT? How will it change our lives in the coming years? With IoT constantly evolving, certain trends always need to be kept pace with. In this article, we have listed the eight prominent Internets of things trends that we should expect in 2024.

Keywords: Internet of Things, IOT Applications, Sensors, Computing

1. Introduction

The Internet of Things is a system of devices that are interconnected via the internet and share data with each other. IoT does not only include smartphones, laptops, and computers. It includes a variety of internet-connected smart devices, like home appliances, toys, wearables, vehicles, etc. that gather and communicate data over a network. IoT began in the early 1980s when a group of engineers at Carnegie Mellon University invented the first internet-connected device, a Coke vending machine. But, it wasn't until the mid-2000s that IoT began to take off with the invention of low-power wireless sensors & the emergence of cloud computing. Today, more than 10 billion devices are connected to the internet, & as per estimates, this number will grow to around 30 billion by 2030. With more devices connected to the internet & the rising future IoT projects, the IoT future is poised to revolutionize industries including healthcare, transportation & manufacturing. Creating new values, prepositions, and potential revenue, the Internet of things is revolutionizing business models, enabling companies to improve their services in real-time. Industries can reap various benefits from the Internet of things. It is useful in various categories like location, inventory control, security, individual tracking, asset tracking, and shipping. Another benefit is it renders a more personalized system to increase business sales and their demographic. The Internet of Things has grown exponentially, fueled by advancements in technology & the need for real-time insights into business operations. As we move ahead 2024, the IoT future looks to be brighter than ever with various trends & predictions on the rise. From advancements in Machine Learning & Artificial Intelligence to the rise of smart cities & integrated supply chains, the possibilities for IoT seem limitless. This blog will take you through some of the most exciting developments in IoT technology & what they could mean for us.

2. Why Iot is Important

Beginners in the field of IoT are more likely to wonder about the potential of IoT network technologies for transforming conventional experiences with digital technologies. What is IoT? The Internet of Things is a network of interconnected devices that can transmit data to each other. For example, the security camera in your home can be an IoT device with a sensor that detects face patterns. You can use your smartphone to operate the camera remotely by interacting with the sensor through the internet. Simultaneously, the sensor could also report metrics regarding the health status of the security camera and point out the ideal time for maintenance.

Many may assume that adding a sensor to any device and connecting to the internet gives you an IoT solution. This is where you need to consider the 'value' you can offer the user with IoT solutions. As the IoT technologies list continues growing, you may think about the ideal approach for making value-based IoT solutions. Understanding the end-users pain points and resolving them with innovative functionalities and seamless user experience can serve as a credible approach to designing IoT-based solutions. The value for the users dictates the importance of IoT.

2.1 Current state of IOT

Before you find out a list of Internet of Things emerging technologies, you must review the existing state of [IoT](#). Should you invest your time in learning about new IoT technologies? Let us look at the following facts about the IoT market to find an answer.

- ✓ The global expenditure on IoT technology in 2020 amounted to \$749 billion. On top of it, IDC estimates suggest that the spending on IoT will reach \$1.2 trillion in 2022.
- ✓ At the end of 2022, there were around 14 billion IoT-connected devices worldwide, which may become around 30.9 billion in 2025.
- ✓ One of the biggest use cases of IoT is outdoor surveillance, with a market share of \$7.6 million.
- ✓ The market research also indicates that consumers will spend around \$88 billion on smart home devices by 2025.
- ✓ IoT Analytics reported that the Internet of Things market size had reached \$201 billion with a year-to-year growth rate of 21.5%.

The numbers about the IoT market showcase how top IoT technologies can find space in the innovative IoT ecosystem. Businesses and consumers have shown more interest in fuelling IoT developments through the growing demand for IoT solutions. New technologies and trends can help speed up the expansion of the IoT market with innovative applications in different industries. At the same time, new IoT technologies could offer prolific improvements in existing IoT networks.

According to major reports, it is projected that the global IoT future market will grow to \$3352.97 billion by 2030, at a CAGR of 26.1%. In 2020 alone, the IoT market was valued at \$742 billion. The adoption of IoT is expected to increase across various industries, such as manufacturing, healthcare & transportation.

3. Future Of Iot In Different Fields

The Internet of Things (IoT) is changing almost all the industries across the globe & healthcare, agriculture & transportation are not an exception. With the ability to connect devices, sensors & equipment to the internet, IoT is enabling a new era of data-driven decision making, automation & optimization.

- ✓ **IoT in Healthcare:** In healthcare, IoT is being used for remote patient monitoring, real-time health tracking, predictive maintenance of equipment & even drug development. Wearable devices can monitor vital signs & alert doctors to any changes in a patient's condition, while smart hospital rooms can track patient movements & adjust lighting, temperature & ventilation accordingly.
- ✓ **IoT in Agriculture:** IoT can help farmers in multiple ways. For example, IoT sensors can monitor soil moisture, temperature, & other relevant factors & help farmers optimize crop yields, reduce waste & prevent crop loss. IoT can also help automate irrigation & spraying systems. Moreover, animal tracking devices can assist farmers manage their livestock's health, reducing the risk of disease outbreaks.
- ✓ **IoT in Transportation:** IoT in transportation can help improve safety & efficiency on the road. Connected cars can communicate with other vehicles & infrastructure to prevent accidents & reduce traffic congestion. In addition, IoT future technology is working towards fleet management & allows companies to monitor fuel usage, vehicle maintenance & driver behavior in real-time.
- ✓ **IoT in Hospitality:** In the hospitality industry, IoT is projected to enhance customer service, reduce operational costs & boost revenue. Smart devices, such as smart locks, air conditioning systems & smart lighting, have been employed to improve guests' experiences. All in all, IoT has the potential to increase efficiency & offer a top-notch guest experience.
- ✓ **IoT in Retail:** IoT in Retail is transforming the shopping experience with the use of in-store beacons, RFID tags & sensors on shelves to track inventory levels & make real-time stock management decisions. It also enables personalized advertising & customer insights to improve overall shopping experiences.
- ✓ **IoT in Manufacturing:** IoT in manufacturing promises improved operational efficiency with predictive maintenance, remote monitoring & real-time asset tracking. Moreover, IoT makes possible for better collaboration between humans & machines, increasing safety standards & overall product quality.
- ✓ **IoT in Smart Cities:** The potentials of IoT in smart cities are limitless. IoT technology provides for traffic control, sensor-based water management systems, waste management & the general monitoring of a city. The result has been an increased level of productivity & better quality of living in various cities globally.

4. Popular Emerging Iot Technologies

4.1 Block chain

One of the prominent concerns in using IoT networks is the safety of user data. IoT networks are massive, and the exchange of sensitive user data among the devices in the network opens up more vulnerabilities. The answers to "What are the latest technologies in IoT?" would draw attention to block chain

technology. Block chain is gradually becoming a vital technology supporting IoT as it can ensure data security. The immutable nature of records on the block chain network can help safeguard user data and transaction details.

4.2 5G Connectivity

Wireless connectivity is one of the basic requirements for creating and ensuring the functionality of IoT networks. 5G not only serves as a stage in the evolution of wireless technology but also offers the power to achieve the full potential of IoT.

4.3 IoT Security

The outline of significant technology trends in IoT for 2023 would also include IoT security. The vulnerability of IoT networks is a crucial concern for developers and businesses. Security technologies will take the limelight in the IoT market in 2023 with new developments in technology for securing IoT devices and platforms from physical and online attacks.

4.4 IoT Data Analytics

Another promising entry among top IoT technologies would draw attention toward IoT data analytics. Data is one of the most significant strategic assets for every business. Quality insights from IoT data could help design productive business strategies and ensure supply chain integrity.

5. Emerging Trends In Iot 2024

Internet of Things (IoT) trends are continually evolving, & staying current is crucial for staying ahead of the curve. Here are a few of the latest IoT trends that you need to watch out for the future of IoT technology:

- ✓ **Edge computing:** Instead of relying on cloud-based systems, IoT devices are processing data on the edge, which enables faster operation & increased efficiency.
- ✓ **Artificial Intelligence:** AI is transforming the IoT devices by providing machine learning capabilities & allowing devices to make intelligent decisions autonomously.
- ✓ **The Rise of IoT-as-a-service:** Businesses are increasingly turning to IoT-as-a-service to implement IoT solutions because of its affordable nature.
- ✓ **Interoperability:** Interoperability refers to IoT devices' ability to connect & communicate with each other & promotes greater data sharing & integration.
- ✓ **5G networks:** 5G networks will provide the necessary speed & bandwidth to handle the increasing number of IoT devices and their data.
- ✓ All in all, IoT is an exciting space that is continually evolving. Businesses must stay up-to-date with the latest IoT trends to leverage the benefits of this technology fully.

6. Impact Of Iot On Privacy And Security

With convenience & efficiency, the Internet of Things (IoT) has also raised some privacy & security concerns. Here are the impacts that the IoT has on the privacy & security aspects:

- ✓ **Increased Susceptibility to Cyber-attacks:** With numerous connected devices, there are more potential entrance points for cybercriminals to exploit leading to data stealing or hacking attacks.
- ✓ **Vulnerability of Personal Data:** The amount & types of data collected by IoT devices are vast, sometimes including sensitive personal information, like healthcare & financial data, & leave users exposed to identity theft & other manipulative activities.
- ✓ **Invasive Data Tracking:** IoT technology experts believe that device makers may be quietly amassing troves of customer data, recording real-life behaviors & building dossiers on users that could eventually be sold or hacked.
- ✓ **Unauthorized Access:** More endpoints mean more opportunities for unauthorized access leading to situations where outsiders could manipulate a particular IoT device or collectively manipulate all the devices in one location.
- ✓ **Compatibility Issues:** Some IoT devices may not be compatible with the latest security technologies leading to privacy and security defects.

7. Conclusion

The outline of emerging IoT technologies showcases how new technologies strengthen the foundations of Internet of Things. Some new technologies build upon the existing IoT ecosystem to introduce additional functionalities. On the other hand, you can also find completely innovative technologies tailored for disruption. The potential for IoT future growth & innovation has never been greater, with the world evolving towards a more automated, connected digital landscape. IoT devices are already offering boundless possibilities for data collection & new applications to emerge in everyday life. As always, there will be challenges such as privacy & security risks that come along with these advancements.

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