



Future Trend in IoT

IoT Technology: A More Connected World

As machines get smaller, it becomes easier to produce. A shift in tech philosophy has occurred recently. Industries have shifted away from a monolithic, single-device model in favor of a more modular, microservices approach. Instead of one device handling every calculation and every measurement, a network of devices can do this instead. Each device may have its own individual utility as well, and it may benefit the entire network. This is the core of IoT technology.

IOT TECHNOLOGY'S GROWTH

According to Mordor Intelligence, the IoT technology market value is expected to rise to [\\$1.39 trillion by 2026](#). This incredible growth is likely due to a number of factors:

- The COVID-19 pandemic accelerated the advancement of remote monitoring, smart home devices, and data analysis solutions.
- Businesses are racing to develop better artificial intelligence solutions. These often require a network of advanced sensors and edge computers within the scope of IoT.
- IoT networks can accomplish some tasks more efficiently than centralized solutions.

Don't get too excited just yet though. There's more to the story.

LIMITED PRODUCTION: THE CHIP SHORTAGE

Due to high demand and low supply of valuable semiconductor chips, IoT solutions have become more expensive to produce. The situation has only worsened due to the pandemic. Although production of these chips has increased, it will take a long time before the [chip shortage](#) is over. Some businesses are choosing to order their semiconductor inventories far in advance instead of using a just-in-time solution.

According to [Forrester](#), the semiconductor shortage in 2022 will limit the growth of IoT markets by 10 to 15%. That sounds like bad news for businesses looking to invest in new IoT solutions, but it's not the whole story.

There is good news on the horizon. In February of 2022, the European Union passed the [European Chips Act](#), a combination of public and private investments to support efforts to resolve the supply chain shortage.

IOT IS POWERED BY BANDWIDTH

The main bottleneck of Internet of Things technology is **bandwidth**. The higher the bandwidth, the lower the latency of an IoT network. The faster a device can communicate with another device, the more fluid and efficient IoT technology will be. If there's too much latency, there's not much of an advantage for IoT over its centralized alternatives. In the past, high-speed networking was limited by cable and fiber connections. An IoT network can be severely limited if every device needs to be connected with an Ethernet cable. Wireless connections can be inconsistent and have slower data rates. However, IoT has surged over the past several years due to advancements in 5G networks and Wi-Fi 6 (802.11ax). With faster wireless data rates than ever, the potential of IoT can be realized.

Trend #1: AIoT - Artificial Intelligence & IoT Technology

One of the most fascinating use cases of IoT technology is to support artificial intelligence software. Artificial intelligence and IoT have a mutualistic relationship. AI is benefitted by IoT with distributed data, and IoT is benefitted by AI with advanced management.

A NETWORK OF DATA

Since artificial intelligence technologies are heavily data driven, IoT sensors are an immense asset to the machine learning data pipeline. Research and Markets reports that AI in IoT technology will reach a value of \$14,799 million by 2026. High quality data is extremely important for the success of machine learning techniques. For example, live data from IoT sensors monitoring factory equipment can help machine learning algorithms determine when equipment needs to be serviced in the future, a practice called predictive maintenance, one of the most important application of [AI in manufacturing](#).

VISUAL INSPECTION: AI AND IOT WORK TOGETHER

Visual inspection is another area where IoT technology and AI synergize to enrich industrial and distribution industries. Check out our video about [AI-driven visual inspection](#) technology to see this in action.

Although [machine learning](#) is extremely adept at identifying patterns, it can't do that without high quality data. With rising bandwidth and increased opportunities for IoT networks to take center stage in various industries, machine learning's use will increase over the next few years.

Read more about [Improving Data Quality With Unsupervised Machine Learning](#)

Trend #2: IoT Connectivity — 5G, Wi-Fi 6, LPWAN, and Satellites

The main challenge that IoT networks have had to overcome in recent years is wireless data rates. As these technologies improve, so too will the aspects of IoT technology, including sensors, edge computing, wearables, smart homes, and more. Recently, more infrastructure has been developed for newer connectivity types that make IoT solutions more feasible. These are connectivity technologies like 5G, Wi-Fi 6, LPWAN, and satellites.

5G: ADVANCED MOBILE NETWORKS

In many IoT technology solutions, connectivity infrastructure needs to be set up before an array of edge devices, sensors, or other devices can be maintained. However, mobile networks like LTE can be a potential alternative for certain situations such as outdoor settings. However, 4G LTE is limited by bandwidth. 5G networks however are much faster and can support data processing needed for IoT networks much more efficiently.

WI-FI 6

For indoor settings, Wi-Fi operating in the 6 GHz band increases the bandwidth potential of IoT technology greatly. The faster that a network of devices can communicate, the more reliable that the system will be. As a bonus, Wi-Fi 6 can be used in households, meaning that this can offer great benefits for smart home IoT networks.

LPWAN

Low-power wide-area network connectivity is an emerging technology that is effective for connecting devices with low-bandwidth usage with low bit rates over larger areas. This makes it a good choice for IoT devices that communicate with one another on a machine-to-machine basis. LPWANs are more energy efficient, making them more cost-effective. If you need to use a large number of devices over a large area, LPWAN technology is a good choice.

SATELLITE

In some cases, IoT technology can be powered by satellites for geographically separated networks. Powered by Globalstar satellites, Traksat's satellite-powered IoT devices enable humanitarian staff to report emergency incidents to immediately request assistance. GPS information is immediately recorded and sent to a headquarters for rescue preparations.

Trend #3: Edge Computing – Low Latency & Security

Real time applications depend on edge computing. Instead of calculating everything at a central source, edge networks process information closer to the user and lighten the load of the entire network for all users.

Not only can edge computing reduce latency of IoT technology, but it also has potential to increase the security of data processing. If data can be processed on an edge device instead of being transmitted to a central server, there are fewer opportunities for it to be intercepted by hackers. All that needs to happen is for the information to be exchanged with the edge device and then handed right back to the user. The information doesn't need to be stored using memory in this case.

Edge computing is useful for any situation where decisions need to be made quickly. This is especially true in contexts like security and safety. Automatically stopping machinery from operating while someone is in a restricted area at a factory is one way that IoT edge computing can be used to protect people from harm. Autonomous vehicles need to receive data to make critical decisions in real-time, and this can mean the difference between life and death on the road.

At MobiDev, we experimented with the use of [edge biometrics for office security](#). The main idea behind the project was to authenticate employees at the office entrance with just a glance in the camera through face and voice biometrics. All operations are done through a single edge device.

Trend #4: Wearable IoT Technology

While sensors and edge devices are important for many IoT technology solutions, wearable IoT devices shouldn't be overlooked. Smart watches, earbuds, and extended reality (AR/VR) headsets are important wearable IoT devices that are making waves in 2022 and will only continue to evolve.

THE FUTURE OF IOT SMARTWATCHES AND WRISTBANDS

In the past, it was expected that wearable technology, smartwatches in particular, would eventually replace the smartphone and desktop computing. However, this prediction doesn't look like it will become reality anytime soon. The limited feasibility of wearable devices like smartwatches makes them much less likely to be useful for tasks you could complete on a smartphone or laptop.

However, wearable IoT technology has immense potential to aid in medical roles due to its ability to keep track of patient vitals. These devices can perform tasks such as

automatically alerting others in case of emergencies and gathering of continuous health records.

AR AND VR

If IoT technology can provide devices with real-time contextual data, then it's clear how this can greatly benefit the performance of AR and VR devices. Being provided with sensor data and real-time network information on a head mounted display can be very helpful for professionals in these situations:

1. Doctors performing surgery aided by head-mounted AR, where wearables and other sensors provide data to the surgeon.
2. A manufacturer reviewing a digital twin simulation of a factory layout in virtual reality. Data from the real factory floor's IoT sensors can be shown alongside the digital twin for performance comparison.
3. A distribution center worker using AR on a mobile device to locate the position of an item in a warehouse, where IoT devices help locate the item and send directions to the worker.

Trend #5: Smart Homes

The rise of Google Assistant, Amazon Echo, Apple's Siri and other digital assistants have transformed the smart home industry. With at-home IoT technology in 2022 now able to manage innumerable devices like lights, appliances, and even home security systems, the technology seems to have reached an apex. However, there is still much more room for growth that we will see over the next several years. According to Mordor Intelligence, the smart home market will have a CAGR of 25% between now and 2025, allowing the industry to reach a size of \$246 billion.

One of the next steps forward is a focus on smart home automation. Smart home IoT networks are now expanding their ability to automate tasks like lighting, temperature control, and security. These can be configured manually by consumers, or they can be tuned automatically using AI algorithms that review sensor and usage data.

On the security side of IoT smart home devices, at MobiDev we collaborated with CUJO AI to build a mobile app that allows users to [monitor the security of their home network](#).

Read more about [Using IoT for Smart Office Automation](#)

Trend #6: Smart Cities

There are many applications for IoT technology when developing smart city networks. Traffic monitoring is one of the most pressing issues. Being able to monitor traffic with sensors placed city-wide enables better control over intersections for better traffic optimization. Water level monitoring can also be useful to help detect and inform citizens about potential and active flooding. This information can also guide additional action to prevent flooding in the future.

[Smart streetlights](#) have a variety of possibilities. As platforms for sensors, they can be used to detect weather conditions, monitor traffic, host public Wi-Fi, and conduct surveillance.

These streetlights can also be used as an edge device that can control digital street signs. They may even have the streetlights mounted on the light pole itself.

[Smart Columbus in Ohio](#) has experimented with self-driving shuttles, a futuristic experiment which shows us that in the future, smart cities can help reduce the need for private vehicles.

In the video below, you can learn more about MobiDev's approach to [IoT smart parking](#) system development.

Trend #7: IoT Technology in Healthcare

Earlier on we talked about wearables and healthcare, but there are other use-cases for IoT technology in this sector. For example, [WebRTC unified with IoT networks](#) can provide more efficient telemedicine in certain areas where it may be more efficient to use edge devices than a traditional Internet connection. There are also plenty of traditional IoT use-cases such as hospital-room sensors that can monitor patient vitals over the course of the day to aid doctors in diagnosis and treatment. The evolution of this technology has accelerated due to the spread of COVID-19.

Read more about [Healthcare Technology Advances and Trends](#)

Trend #8: Connected Networks Aid Manufacturers

IoT technology has a great deal of potential to advance the manufacturing industry. With arrays of sensors on factory floors, this industry has become more automated than ever before. One of the most important results of the expansion of IoT sensors in manufacturing is that these networks are powering advanced artificial intelligence applications. AI can't provide solutions like predictive maintenance, defect detection, digital twins, and generative design without critical data provided by sensors.

Read also [Industrial IoT: The Internet of things in Manufacturing](#)

What's Next for IoT Technology in 2022 and Beyond?

The future of IoT technology lies in each of the previous trends and beyond with possibilities extending into many areas like the [retail industry](#) and [indoor navigation](#). It's also important to realize that the Internet of Things is not a technology that functions alone in many cases. Synergizing technologies like IoT and AI is what enables businesses to cultivate innovation and remain relevant against their competitors. All it takes to get started

is an idea or a vision to modernize your business's infrastructure to take the future head on.

At MobiDev, we believe in making your vision a reality. As an IoT development and consulting company, we're here to help you with every aspect of your [IoT application development](#) across various industries.

If you're ready to take the first step toward modernizing your business, please reach out to us so we can get started talking about how we can work together to realize your goals.