

## THE INTERNET OF THINGS AND ITS GROWING POPULARITY IN MODERN SOCIETY

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**The Internet of Things (IoT), its structure, and its work principles are discussed in the paper. IoT's main features and use cases are also mentioned. The term "smart home" and its impact on the popularity of IoT are considered. The most common IoT ecosystem distributors and IoT-friendly companies, as well as their products, are listed and described. The possible directions of IoT development are mentioned.**

The history of humanity is closely related to new inventions and discoveries, which make people's lives and work more manageable and convenient. We have moved on from creating new tools for harvesting and weapons to improving our household and eventually have come to the creation of IoT as a peak of our current technological progress. Over the past few years, IoT has become one of the most critical technologies of the 21st century. It has made seamless communication between things and processes possible via embedded devices connected to the global network, which is a significant leap in integrating the digital world into the real world, even compared to the 2000s.

As with any technology in the world, IoT has its principles of functioning, use cases, and directions for future development. Speaking about the essence of IoT, the most common definition of IoT states that it is a network of interconnected devices (actually called "things") and mechanisms that constantly interact, independently exchange and process information to later act on [1]. The word "thing" here can refer to any object that does not require human control over itself and can be attributed to the Internet Protocol. IoT devices can vary in size, materials, the way they operate, and the scope of application, so there are no other restrictions on what an IoT device should be, except for access to IP. Some larger objects themselves can be filled with many smaller components of IoT, such as a jet engine, which is now filled with thousands of sensors collecting and transmitting data back to ensure its efficient operation.

A typical IoT network also includes devices called gateways or hubs – the basis for the functioning of the system. These appliances transmit raw input data to cloud servers for processing so that the data can meet the requirements of other devices. Moreover, gateways can also interact with each other and operate on the information they receive from each other, increasing the speed of their performance and, consequently, the speed of data transfer to other gadgets involved in the network, of which, by the way, there are dozens.

IoT is already a giant network with twice as many devices as there are people on Earth, but it continues to grow in size rapidly, and this growth, as a rule, does not tend to stop in the foreseeable future. Some calculations show that the number of connected devices around the world has already reached 16.4 billion, and its growth speed will not slow down. According to Statista, forecasts show that by 2025, about 30.9 billion such IoT devices will be used worldwide [2]. They will create a massive web of interconnected appliances that include everything from smartphones to kitchen equipment. But what are the reasons for the truly magnificent popularity of IoT?

Imagine such a scenario: you wake up in your bed when the alarm goes off, you see that the blinds are automatically raised, letting the sunlight fill your airy room. The coffee machine has already started making coffee for you, and your voice assistant greets you with information about the traffic jams on the way to work and today's weather. When you go to the kitchen, the light turns on automatically, and the air conditioner adjusts the air temperature according to your body. After looking at the shelves of your refrigerator, you realize that you need to go to the grocery store to buy some food, but with a simple command, your refrigerator orders food delivery and displays the time when food is delivered.

As you might have guessed, the answer to this question is quite simple: IoT is ideal for any sphere of life, from improving the automation of your household to helping international corporations or involvement in agricultural and industrial development. However, it is smart homes that really make IoT more accessible to ordinary people, which makes up a large part of its popularity in society. Smart homes are, in fact, sets of specific sensors, monitors, hubs, and other devices compatible with IoT, such as kettles, light bulbs, vacuum cleaners, and air conditioners which automate your home routine, reducing your workload. They have already become a part of our life as the simplest form of the local IoT system. Even a humidity sensor with Internet access or a single desk lamp with remote control is an IoT device. If they are configured and connected to your smartphone via Wi-Fi, they are part of the IoT. Currently, several leading companies provide their customers with 100 % functioning smart home systems [3]:

Google's Nest devices and Google Assistant are fully available in the Google Store both offline and online and can be ideal for any Android device to create a smart home.

Apple with Apple HomeKit and its own voice assistant Siri which runs on iPhones, iPads, Macs, iMacs, and Apple HomePods and it can even be accessed via headphones.

Amazon's Alexa Smart Home with its own Amazon Web Services and versatility due to the number and variety of supported devices from other companies.

Integrating their products with the Siemens and Bosch Internet of Things-oriented kitchen equipment, Phillips, and Xiaomi light bulbs will give you the best experience of living in a smart home. Moreover, constant system and security updates will improve your day-to-day experience, making this integration really smooth and comfortable.

Such a wide variety of IoT systems and gadgets that can be combined or replaced by one another means that a new era of technologies has arrived; smart homes are already capable of performing 70 % of our household routine and will soon join each other in such complex structures as smart cities, expanding the possibilities of communication between the real world and the digital world. IoT used in business can quickly create unimaginably huge volumes of raw data that are too large for people to view and process. In addition, the data collected during the deployment of extensive IoT devices can be processed and analyzed to make vital business forecasts or even train Artificial Intelligence systems based on the real data collected from extensive sensor arrays.

All these facts make IoT a promising area of research and a sustainable technology for investment. With all the benefits it brings to people, IoT is too important for further technological progress to abandon it. In the near future, it will constantly expand, integrating with other technologies, such as Blockchain, Augmented Reality, or AI, so that IoT will shape the technologies of the future, the future world, and the future society.

**References:**

1. What is IoT? Oracle Corporation – American multinational computer technology corporation [Electronic resource] – Access mode: <https://www.oracle.com/internet-of-things/what-is-iot/> – Date of access: 23.03.2022.
2. Internet of Things (IoT) and non-IoT Active Device Connections Worldwide to 2025. Statista – Global Business Data Platform [Electronic resource] – Access mode: <https://www.statista.com/statistics/1101442/iot-number-of-connected-devices-worldwide/> – Date of access: 27.03.2022.
3. Top Smart Home Companies in the USA. Home Automations – Internet portal about smart home systems and gadgets [Electronic resource] – Access mode: <https://home-automations.net/top-smart-home-companies-in-usa/> – Date of access: 27.03.2022.