

CLOUD TECHNOLOGY AND ROBOTICS - A NEW ERA OF ECONOMIC AUTOMATION

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Abstract: The article discusses the term robotics and its role in the digital economy, as well as the annual automation rate of countries. It can be seen that the growth of cloud technologies is compared to traditional IT spending.

Keywords: Robotics, digital industry, automation indicator, Cloud technology, Virtual storage, Traditional IT costs, sustainable growth.

Robotics is understood as the combined field of science, engineering, and technology based on the operation of electronic computing machines known as automated systems that replace human actions and contribute to the sustainable development of the region’s digital economy. Currently, in the sustainable development of regional industries, large-scale manufacturing companies are widely using robots. Statistical observations show that a 1% increase in the use of robots in digital industrial sectors leads to a 5.1% increase in production efficiency. The following graph presents the annual automation indicators of the five largest countries in relation to the number of robots, showing that China has achieved rapid growth in automation.

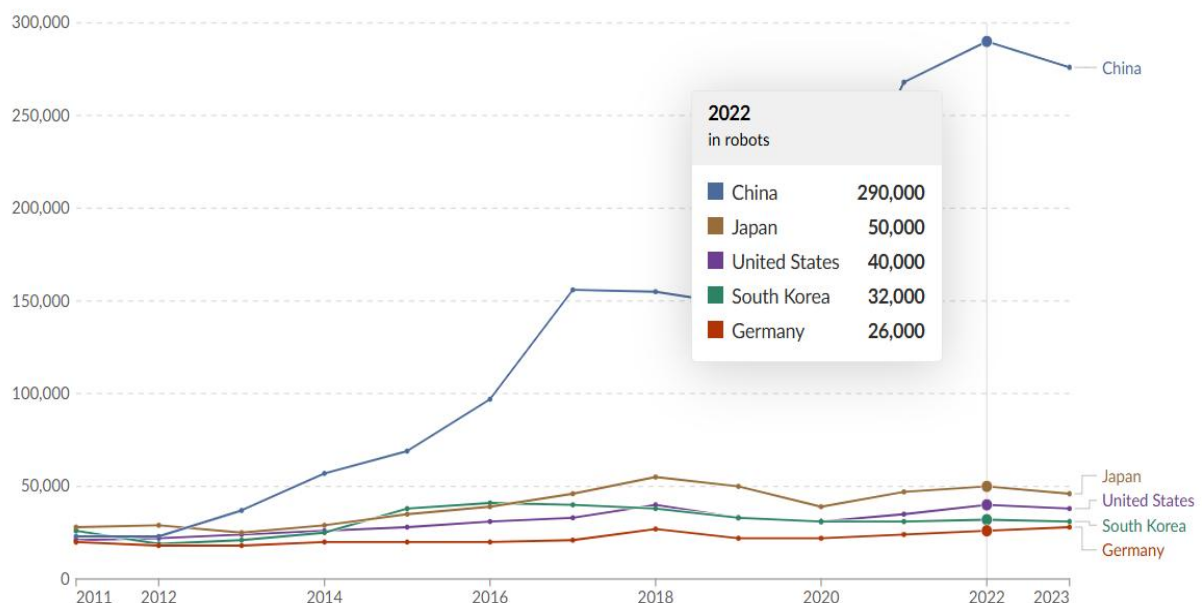


Figure 1.1.1. Annual Automation Indicator¹

This graph shows the five countries that installed the most industrial robots in the world between 2011 and 2023 - China, Japan, the United States, South Korea, and Germany. China demonstrated the greatest growth. While only about 20,000 robots were installed in 2011, this figure reached 290,000 by 2022. This made China the world’s largest producer and user of

¹ <https://ourworldindata.org/grapher/annual-industrial-robots-installed?time=earliest..2023>

robots. Japan ranks second, having installed 50,000 robots in 2022, and is considered one of the global leaders in industrial robotics.

In 2022, the United States installed 40,000 robots, South Korea - 32,000, and Germany - 26,000. Growth in these three countries has been steady but not as rapid as in China. The graph illustrates that industrial automation and digital technologies are increasingly becoming an integral part of the global economy. In particular, China has made remarkable progress in this field, achieving significant success in improving production efficiency and strengthening the foundation of its digital economy.

In conclusion, robotics is one of the most important areas of the digital economy. It enhances efficiency in production, transportation, healthcare, education, and service sectors. Robots make human labor easier by reducing time and costs through automated systems, improving product quality, and ensuring greater safety in production processes. Moreover, robotics, in combination with artificial intelligence, cloud technologies, and big data, accelerates the digital transformation of the economy. As a result, countries advance technologically, develop new innovative solutions, and increase their competitiveness. Therefore, robotics plays a decisive role not only in improving production but also in making the entire economic system more efficient, digital, and sustainable.

Cloud technology, in its simplest definition, stores users' data through a digital network. Your information is stored in the cloud without taking up space on your phone or computer. By using your email and password, you can access your files and data from other devices. Thus, cloud technology allows you to store and share information across your different devices.

Cloud technology enables data storage over the internet through various software applications. With virtual storage, your data is kept online, so you no longer need physical storage devices such as hard drives. You can also access your information at any time. Cloud technology is provided through APIs (Application Programming Interfaces) and offers three main categories of services: IaaS (Infrastructure as a Service), PaaS (Platform as a Service), and SaaS (Software as a Service).

Cloud technologies are an essential component of the modern digital economy. They create broad opportunities for enterprises, government organizations, and entrepreneurs to store and process data as well as automate business processes. Through cloud technologies, companies can avoid purchasing expensive servers or technical infrastructure and instead use them as a service. As a result, costs are reduced, and operational expenses replace capital investments. For example, a small business that stores its data on Amazon Web Services (AWS) or Google Cloud can reduce server expenses by 40-60%.

Cloud technologies also play a major role in expanding remote work and global collaboration. With their help, employees can work from anywhere in the world, which enhances international business relations, increases productivity, and strengthens cross-border economic activity. For instance, services such as Microsoft Teams or Google Workspace allow companies to manage offices in different countries within a unified system.

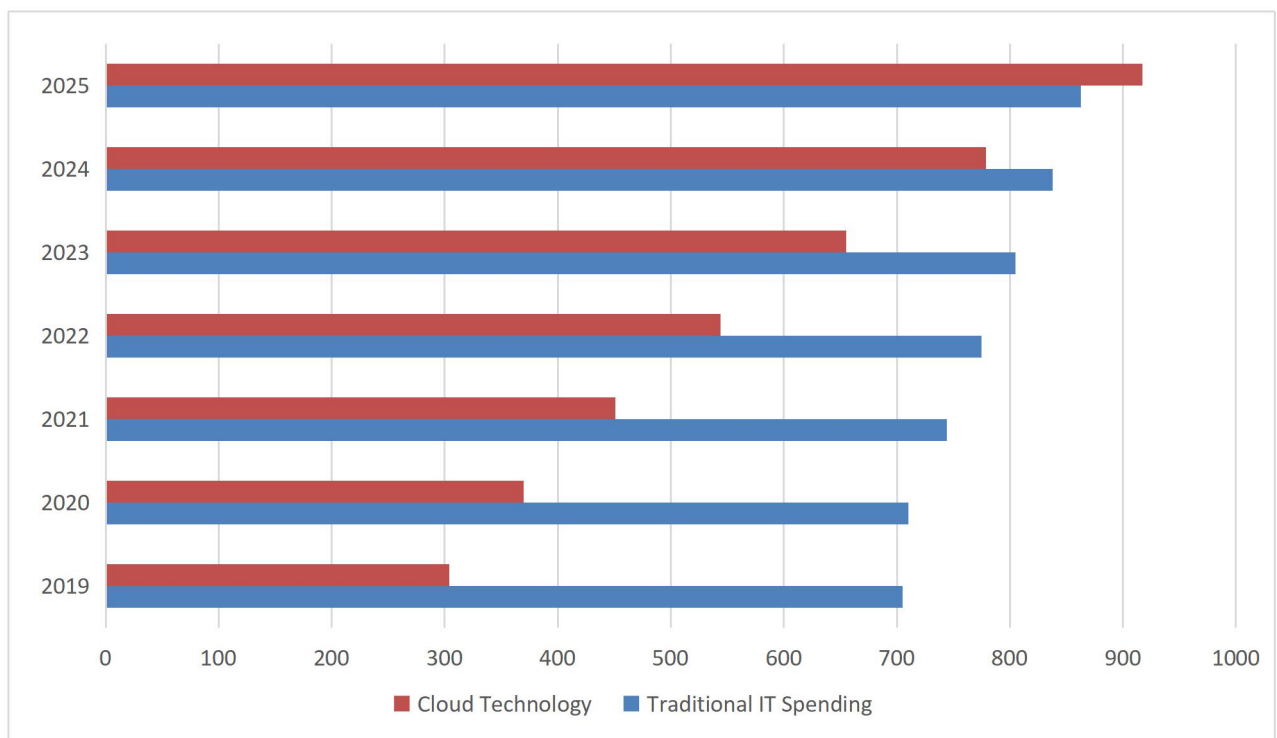


Figure 1.1.2. Cloud Technology vs. Traditional IT Spending (\$B) Worldwide²

As shown in the diagram, between 2019 and 2025, global spending on cloud technologies and traditional IT systems has changed significantly. From 2019 to 2021, spending on traditional IT systems was much higher than on cloud technologies. However, starting from 2022-2023, investments in the field of cloud technologies began to increase rapidly. The most notable point is that by 2025, spending on cloud technologies has surpassed that of traditional IT systems. This indicates that companies, organizations, and governments worldwide are shifting their infrastructure from traditional systems to modern cloud-based solutions.

Cloud technologies are an integral part of the digital economy. They simplify the processes of storing, processing, and using data, and also enable companies to manage their IT infrastructure without the need for expensive equipment. Moreover, cloud technologies provide businesses with flexibility, security, speed, and cost efficiency. For example, instead of spending large amounts on upgrading or maintaining their own servers, companies can use cloud services to access the same capabilities at a lower cost.

The most important advantage of investing in cloud technologies is that it ensures the sustainable development of the digital economy. This is because fields such as Artificial Intelligence (AI), Big Data, e-commerce, online banking systems, and the Internet of Things (IoT) all rely on cloud infrastructures. Therefore, investments in cloud technologies today contribute not only to the growth of the IT sector but also to the faster and more efficient development of the entire digital economy.

The following graph illustrates how rapidly global spending on cloud technologies is increasing.

² Author's work.

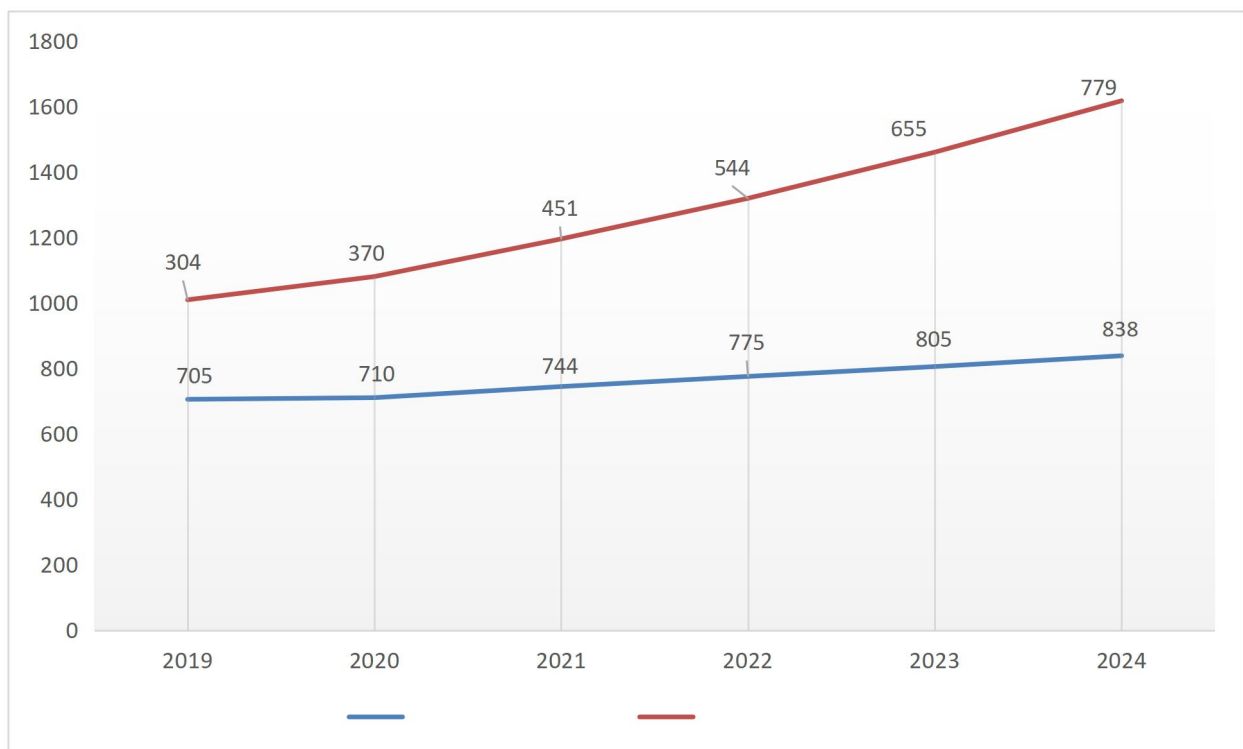


Figure 1.1.3. Annual Revenue Growth (\$B)³

Cloud systems also play an important role in ensuring data security. Information is stored in encrypted form, and automatic backups are created, which reduces the risk of data loss in economic organizations and ensures the reliable protection of financial and tax data.

In conclusion, cloud technologies serve as the foundation of digital transformation in the economy. They enable the efficient use of resources, reduce production costs, foster the development of an innovative economy, and ensure the sustainable growth of the digital economy. For this reason, many countries today are investing heavily in expanding cloud infrastructure.

If cloud technologies and robotics are widely developed in **Uzbekistan**, they would bring significant benefits to the country's economy, education, industry, and service sectors. First of all, cloud technologies make it possible to securely store, process, and quickly access data from anywhere. This allows companies and organizations to operate efficiently without spending large amounts on IT infrastructure. Through cloud systems, business processes can be automated, online services can expand, and data exchange in government administration can become more efficient. As a result, the quality of digital services improves, and both time and resources are saved.

Robotics, on the other hand, helps reduce human labor in production and service sectors while increasing accuracy and speed. Automating production processes in factories through robots improves product quality and reduces manufacturing costs. In medicine, education, and agriculture, the use of robots increases efficiency and reduces human-related errors.

In addition, the joint development of these two technologies in Uzbekistan would lead to the creation of new IT startups, innovation centers, and job opportunities. It would also expand opportunities for young people to learn and apply advanced technologies in practice.

³ Author's work.

Overall, the development of cloud technologies and robotics would provide Uzbekistan with greater economic efficiency, digital security, innovative growth, and an improved standard of living for its people.

The successful development of the digital economy is closely linked to the adoption of advanced technologies such as artificial intelligence (AI), Big Data, Blockchain, cloud technologies, and robotics. These technologies make it possible in **Uzbekistan** to automate production processes, securely store and analyze data, ensure transparency in management, and create new job opportunities. As a result, economic efficiency increases, the quality of services improves, and public welfare rises. Furthermore, the development of these fields strengthens the technological mindset of the younger generation, enhances scientific and innovative potential, and helps transform Uzbekistan into one of the leading digital hubs in the region. Therefore, investing in digital technologies is a key factor for the country's sustainable economic growth and future competitive development.

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