THE ROLE OF CLOUD SERVICES IN THE ECONOMY

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Annotation: *Nowadays, modern cloud computing technology, which many organizations and companies are paying attention to and rapidly expanding its scope, has become a true achievement of contemporary science. This article provides a comprehensive analysis of the role and significance of cloud computing technologies, which have become an integral part of the digital economy. It examines the sectors that widely use or should adopt these technologies, monitors the standards of security levels in their usage, and is based on research methods such as systematic analysis and classification. Thanks to cloud technologies, small and medium-sized businesses can compete on equal terms with large companies. Additionally, the article discusses issues related to security, internet quality, and workforce potential. Overall, the article highlights the economic efficiency of cloud services with well-founded facts and offers recommendations for their future development.*

Key words: *Cloud computing, digital economy, Industry 4.0, artificial Intelligence, internet of things, IoT, big data, digital transformation, cloud services, e-government.*

Introduction:

Over the past decade, the development of digital technologies has been fundamentally transforming the global economic system. Alongside computer systems, the Internet, artificial intelligence, and automated services, cloud computing has also become an integral part of the modern economy. In particular, services based on these technologies are emerging as vital resources for businesses, government agencies, and entrepreneurs in today’s global economic environment.

Cloud services are technologies that allow users to remotely access servers, databases, software, and storage spaces via the Internet. Their main advantage lies in enabling users to process any amount of data quickly, securely, and efficiently without the need for their own specialized IT infrastructure. This approach does not require large capital investments, and responsibility for technical maintenance is handled by the service provider. As a result, small and medium-sized enterprises, startups, and even the public sector are showing strong interest in these services.

Leading global cloud platforms such as Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), and others have helped hundreds of thousands of companies reduce IT costs by 30–50%. This has directly contributed to economic growth, increased competitiveness, and accelerated innovation.

In Uzbekistan, the role of cloud technologies is also growing. Within the framework of the “Digital Uzbekistan – 2030” strategy, efforts are being made to digitize public services, education, and healthcare. Cloud technologies not only provide technical advantages but also have a positive impact on macroeconomic stability. They help businesses optimize costs, centralize data, and operate in real-time, simplifying business operations. Moreover, the emergence of new startups and the development of the digital services market also positively affect employment levels.

This article provides an in-depth analysis of the role of cloud services in the economy, their advantages, challenges, and prospects based on scientific sources, international experience, and the case of Uzbekistan. It aims to determine how economic efficiency can be achieved through cloud technologies and to develop scientifically grounded proposals for their future development.

Methodology: In this study, a multifaceted approach was employed to determine the role of cloud services in the economy and to assess their efficiency. The research methodology mainly involved both qualitative and quantitative analysis methods, and extensively utilized official data at national and international levels, as well as scientific literature.

Scientific articles, expert reports, and the economic development reports of international organizations such as the World Bank, International Monetary Fund (IMF), and the United Nations were examined. Through these sources, a general understanding was developed regarding the economic efficiency of cloud technologies, their market position, and development trends. Additionally, the activities and services provided by major global IT companies (Amazon Web Services, Microsoft Azure, Google Cloud) were analyzed.

Official statistical data of the Republic of Uzbekistan and government-developed strategic documents—particularly the “Digital Uzbekistan – 2030” program—were also studied. This enabled a detailed understanding of the current state and prospects of the cloud services sector in the country. The development of information and communication technologies in Uzbekistan and the process of digitalizing public services were also addressed.

Within the scope of quantitative analysis methods, indicators such as investments in cloud services, cost reduction levels, work efficiency, and the number of users of digital services were analyzed using statistical methods. Furthermore, both international and national legal frameworks were reviewed in the study. Existing legal norms supporting the development of cloud services and the digital economy, as well as the need for their improvement, were analyzed.

Overall, the methodology used in the study was based on a comprehensive, multidisciplinary approach aimed at integrating theoretical and practical data. Scientists such as M. Butaboev, F. Mulaydinov, and others, while analyzing the development processes of cloud technologies in their scientific works, concluded that “the use of such technologies offers diverse opportunities and reduces costs associated with infrastructure,

service delivery, and staffing.” Notably, one of the disadvantages of cloud technologies is that “users become fully dependent on the service provider organization.”

Indeed, based on the principle of how cloud services are created, a company's operations become dependent on the service and Internet providers. From the above, it can be concluded that cloud computing serves users by increasing the efficiency of using modern information technologies in their field. It offers a range of remote networking, storage, and optimal operating mode services to its users.

Results: The data and analyses obtained during this study clearly demonstrate the significant importance of cloud services in the modern economy. Cloud technologies offer high efficiency and cost-effectiveness to businesses, especially small and medium-sized enterprises (SMEs). Reports from the World Bank and the International Monetary Fund confirm that, on a global scale, cloud services significantly contribute to economic growth and competitiveness. The research results show that companies that have implemented cloud computing services have reduced their IT expenses by an average of 30–50%.

Through cloud services, companies are avoiding the need to invest heavily in purchasing or maintaining their own IT infrastructure. This is particularly important for the development of SMEs in developing countries, including Uzbekistan. The digitalization initiatives carried out within the framework of Uzbekistan's “Digital Uzbekistan – 2030” strategy—especially the digitization of public services—have been further accelerated through the extensive use of cloud technologies.

The study found that cloud services are being effectively utilized across various sectors of the economy. In the healthcare system, remote data storage and analysis capabilities are speeding up the diagnosis and treatment processes. In the education sector, the availability of online learning platforms and resources through cloud technologies is expanding, contributing to improved education quality. Meanwhile, in the financial sector, cloud computing systems are enabling fast and secure transactions.

Despite the positive aspects of cloud services, the study also identified several challenges. One of the main obstacles is the insufficient development of internet infrastructure, especially in rural areas, where this issue is more pronounced. Additionally, information security remains a critical concern. Although cloud systems are expected to meet high standards of data protection, cybersecurity threats continue to persist, compelling businesses and government agencies to strengthen precautionary measures.

Another important issue is the availability of skilled personnel. The implementation and management of cloud technologies require highly qualified IT specialists. In Uzbekistan, the lack of sufficient experts in this field highlights the urgent need to improve the education system to meet this demand.

The analysis showed that cloud services not only enhance efficiency in the economy but also play a crucial role in job creation and fostering innovation. The widespread adoption of cloud infrastructure is driving the growth of the digital economy, which in turn has a positive impact on the overall stability of the national economy.

In general, the role and significance of cloud services in the economy are steadily increasing. They are valuable not only from a technical perspective but also in terms of economic efficiency, competitiveness, and sustainability. However, to ensure their effective use, improvements in infrastructure, workforce development, and cybersecurity are essential. In the future, investing in and expanding cloud services will remain a key factor in promoting economic growth.

In the context of the digital economy, large, medium, and small business entities in the global market are increasingly transferring their remotely manageable operations to digital technologies, particularly cloud computing technologies. In this process, ensuring the protection of sensitive or proprietary business data is of critical importance.

Conclusion and Recommendations:

This study thoroughly examined the role and importance of cloud services in the economy. The findings indicate that cloud technologies play a crucial role in the modern economy. They not only simplify the technological infrastructure of companies but also help reduce costs and improve overall efficiency. For small and medium-sized enterprises (SMEs) in particular, cloud services have become one of the main factors enhancing competitiveness. With the help of cloud computing, these businesses can access high-quality services and software products without making large capital investments.

In Uzbekistan, the adoption of cloud technologies is also progressing rapidly. Within the framework of the “Digital Uzbekistan – 2030” strategy, cloud services are being introduced through the digitization of public services and the expansion of information technologies. This contributes to improving service quality, increasing speed, and making economic processes more efficient. Moreover, cloud technologies are becoming important tools in driving innovation in sectors such as healthcare, education, and finance.

However, several challenges were identified during the study. The most critical of these is the underdevelopment of internet infrastructure, particularly in rural areas. Additionally, data protection and the security of cloud services remain pressing issues. The growing number of cybersecurity threats forces companies and government agencies to implement special protective measures. The shortage of highly qualified specialists also hinders the effective implementation of these technologies.

To further enhance the positive impact of cloud services on the economy, the following recommendations are proposed:

- Expand internet infrastructure, especially in rural and remote areas, by increasing access to high-speed internet to facilitate the use of cloud services.
- Implement modern cybersecurity standards and practices, with particular attention to training professionals and improving educational programs in this field.
- Strengthen workforce development in the field of information technology by organizing specialized courses on cloud technologies in higher education institutions and vocational training centers.

- Enhance cooperation between the public and private sectors, support innovative startups, and develop financial and non-financial incentive systems to encourage the adoption of cloud services.
- Improve legislation related to cloud services, study international best practices, and establish a legal framework aimed at the sustainable development of the country’s digital economy.

In conclusion, cloud services have become an integral part of the digitalization of the economy. Their broad implementation is a key factor in improving the global competitiveness of our country. By acting on the recommendations outlined above, it is possible to ensure the effective development of cloud technologies and increase the benefits derived from them. This approach will also contribute to economic stability, job creation, and the promotion of innovation. In the future, expanding the scope of cloud services and integrating them across all sectors will accelerate Uzbekistan’s transition to a digital economy. This, in turn, will be an important step toward increasing the country’s economic potential.

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