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## THE ROLE OF 5G TECHNOLOGIES IN IMPROVING THE ECONOMIC PERFORMANCE OF TELECOMMUNICATION ENTERPRISES

Saidqosimova Umida Ibragimovna

PhD Student,

Tashkent University of Information Technologies named after Muhammad al-Khwarizmi

ORCID: 0009-0008-4477-3087

E-mail: umidasaid11@gmail.com

**Abstract.** This article examines the role of 5G technologies in improving the economic performance of telecommunication enterprises. The study analyses the impact of 5G on network efficiency, service quality, revenue diversification, operational cost reduction, and customer experience. The article highlights that 5G technologies are not merely a technical upgrade of mobile networks, but also a strategic tool for developing new digital services, expanding business opportunities, and increasing the competitiveness of telecommunication companies. Based on the analysis, practical recommendations are proposed for the effective use of 5G technologies to improve the economic efficiency of telecommunication enterprises.

**Keywords:** 5G technologies, telecommunication enterprises, economic performance, digital transformation, network efficiency, revenue diversification, operational costs, digital services, competitiveness.

**Аннотация.** В данной статье рассматривается роль технологий 5G в повышении экономической эффективности телекоммуникационных предприятий. В исследовании проанализировано влияние 5G на эффективность сетевой инфраструктуры, качество услуг, диверсификацию доходов, снижение операционных затрат и улучшение клиентского опыта. Отмечается, что технологии 5G являются не только техническим обновлением мобильных сетей, но и стратегическим инструментом развития новых цифровых услуг, расширения бизнес-возможностей и повышения конкурентоспособности телекоммуникационных компаний. На основе проведённого анализа предложены практические рекомендации по эффективному использованию технологий 5G для повышения экономической эффективности предприятий связи.

**Ключевые слова:** технологии 5G, телекоммуникационные предприятия, экономическая эффективность, цифровая трансформация, эффективность сети, диверсификация доходов, операционные затраты, цифровые услуги, конкурентоспособность.

### INTRODUCTION

In recent years, fifth-generation mobile technology, commonly known as 5G, has become one of the key drivers of digital transformation in the telecommunication sector. Unlike previous generations of mobile networks, 5G is not limited to providing faster internet access for individual users. It creates new opportunities for telecommunication enterprises to improve network capacity, reduce latency, enhance service quality, introduce innovative digital services, and develop new revenue streams in both consumer and business markets.

The economic role of mobile technologies is rapidly increasing at the global level. According to GSMA, mobile technologies and services generated USD 7.6 trillion for the global economy in 2025, which was equivalent to 6.4 percent of global GDP. By 2030, this contribution is expected to reach USD 11.3 trillion, mainly due to the wider adoption of 5G, artificial intelligence, and other digital technologies. This shows that 5G is not only a technological innovation, but also an important factor influencing productivity, business efficiency, and economic growth.

The spread of 5G networks is also accelerating. The International Telecommunication Union reported that 5G covered 55 percent of the world's population in 2025, although the level of coverage remains uneven between high-income and low-income countries. In high-income countries, 5G coverage reached 84 percent of

the population, while in low-income countries it was only 4 percent. This gap demonstrates that the economic benefits of 5G depend not only on technology deployment, but also on investment capacity, infrastructure development, regulatory support, and market readiness.

## LITERATURE REVIEW

The role of 5G technologies in improving the economic performance of telecommunication enterprises is closely related to the theories of competitive advantage, digital transformation, and innovation management. Porter (1985) argues that firms achieve competitive advantage by reducing costs, differentiating services, and creating higher value for customers. In telecommunication enterprises, 5G can support these goals by improving service quality, increasing network capacity, and enabling new digital services.

Teece, Pisano, and Shuen (1997) emphasise the importance of dynamic capabilities, which allow firms to adapt to rapidly changing technological and market conditions. This approach is relevant to telecommunication companies, as they need to modernise infrastructure and update their service portfolios in response to the development of 5G technologies.

Bharadwaj et al. (2013) state that a digital business strategy should be integrated into a company's overall business strategy. Therefore, 5G deployment should be considered not only as a technological upgrade, but also as a strategic tool for increasing revenue, operational efficiency, and competitiveness.

Westerman, Bonnet, and McAfee (2014) note that successful digital transformation depends on the effective combination of digital technologies and management capabilities. Similarly, Verhoef et al. (2021) highlight that digital transformation changes business models, customer relationships, and value creation processes.

Overall, the literature shows that 5G technologies can improve the economic performance of telecommunication enterprises by increasing network efficiency, reducing operational costs, improving customer experience, and creating new revenue opportunities.

## RESEARCH METHODOLOGY

This study uses qualitative and analytical research methods to examine the role of 5G technologies in improving the economic performance of telecommunication enterprises. The research is based on the analysis of scientific literature, international reports, statistical data, and industry-related documents.

During the study, comparative analysis, systematic analysis, generalisation, and statistical analysis methods were applied. Comparative analysis was used to study international experience in 5G implementation and its impact on telecommunication companies. Systematic analysis helped identify the main factors through which 5G influences economic performance, including network efficiency, service quality, operational costs, customer experience, and new revenue opportunities.

In addition, statistical data from international organisations such as GSMA, ITU, and Ericsson were reviewed to evaluate global trends in 5G development. Based on the collected data and literature review, conclusions and practical recommendations were developed for improving the economic performance of telecommunication enterprises through the effective use of 5G technologies.

## ANALYSIS AND RESULTS

Based on international studies and practical experience, the impact of 5G technologies on the economic performance of telecommunication enterprises can be classified into four main directions.

The first direction is the improvement of network efficiency. In this regard, 5G allows telecom operators to increase network capacity, reduce latency, and serve a larger number of users with higher data traffic. Compared with previous mobile generations, 5G creates better opportunities for high-speed internet, stable connectivity, and real-time data transmission. For telecommunication enterprises, this means improving service quality and reducing network overload, especially in large cities and areas with high internet demand.

The second direction is revenue diversification. Traditional telecom revenues are mainly based on voice communication, SMS, and mobile internet packages. However, 5G enables new sources of income, such as fixed wireless access, IoT services, private 5G networks, cloud-based services, smart city solutions, and industrial digital platforms. Therefore, 5G can help telecommunication enterprises move from traditional communication services to more profitable digital business models.

The third direction is operational cost optimisation. 5G networks create opportunities for the automation of network management, predictive maintenance, and more efficient use of infrastructure. Artificial intelligence and data analytics can be used together with 5G to monitor network performance, identify technical problems in advance, and reduce maintenance costs. As a result, telecom companies can increase operational efficiency and improve service reliability.

The fourth direction is the improvement of customer experience. 5G provides higher speed, lower latency, and better connection quality, which directly affect customer satisfaction. In a competitive telecom market, service quality, speed, and stability are among the most important factors influencing customer loyalty. Therefore, 5G can become a strategic tool for telecom companies to retain customers and strengthen their market position.

The global expansion of 5G shows that this technology is becoming one of the main drivers of the digital economy. According to GSMA, mobile technologies and services contributed USD 7.6 trillion to the global economy in 2025, accounting for 6.4 percent of global GDP. By 2030, this contribution is expected to reach USD 11.3 trillion. This growth is strongly connected with the wider adoption of 5G, artificial intelligence, IoT, and other digital technologies.

According to the International Telecommunication Union, in 2025, 5G networks covered 55 percent of the world's population. However, there is a significant difference between countries by income level. In high-income countries, 5G coverage reached 84 percent, while in low-income countries it was only 4 percent. This shows that the economic effect of 5G depends not only on the technology itself, but also on infrastructure investment, the regulatory environment, and market readiness (Table 1).

**Table 1**  
Key indicators of global 5G development<sup>1</sup>

| Indicator                                                    | Year | Value             | Economic meaning                                                     |
|--------------------------------------------------------------|------|-------------------|----------------------------------------------------------------------|
| Contribution of mobile technologies to global GDP            | 2025 | USD 7.6 trillion  | Shows the economic importance of the mobile sector                   |
| Share of mobile technologies in global GDP                   | 2025 | 6.4%              | Confirms the role of mobile services in global economic growth       |
| Forecasted contribution of mobile technologies to global GDP | 2030 | USD 11.3 trillion | Indicates future growth potential of digital and 5G-based services   |
| Global 5G population coverage                                | 2025 | 55%               | Shows that more than half of the world's population is covered by 5G |
| 5G coverage in high-income countries                         | 2025 | 84%               | Reflects strong infrastructure and investment capacity               |
| 5G coverage in low-income countries                          | 2025 | 4%                | Indicates a serious digital divide                                   |
| Global 5G subscriptions                                      | 2025 | About 3 billion   | Shows growing demand for 5G services                                 |

The table shows that 5G technologies are not only a communication tool, but also a source of economic growth and business transformation. The expected increase in 5G subscriptions from about 3 billion in 2025 to 6.4 billion in 2031 indicates that demand for high-speed and low-latency services will continue to grow. For telecommunication enterprises, this creates opportunities to increase revenues and expand digital services.

The economic performance of telecommunication enterprises can be improved through several 5G-based mechanisms. First, 5G increases data traffic capacity and allows operators to serve more users without a significant decline in service quality. This is especially important because modern consumers use mobile internet not only for communication, but also for video streaming, online education, digital banking, e-commerce, and remote work.

Second, 5G supports the development of B2B services. Telecom operators can offer private 5G networks to industrial enterprises, logistics companies, hospitals, universities, and smart city projects. These services are usually more profitable than traditional consumer mobile packages because they are based on long-term contracts and high-value digital solutions.

Third, 5G can reduce operational costs through automation. Network monitoring, traffic management, and technical maintenance can be improved using artificial intelligence and real-time data analytics. This reduces service interruptions, improves network reliability, and lowers maintenance expenses.

Fourth, 5G improves customer experience. Higher internet speed, lower latency, and stable connectivity increase customer satisfaction. In the telecom market, where customers can easily switch from one operator to another, service quality becomes one of the key factors of competitiveness.

Despite its economic advantages, 5G implementation also creates several challenges for telecommunication enterprises. The first challenge is the high cost of infrastructure. Building 5G networks requires large investments

<sup>1</sup> author's development

in base stations, fibre-optic infrastructure, spectrum licences, and network modernisation. Therefore, telecom companies need long-term investment planning and effective cost management.

The second challenge is monetisation. Although 5G requires large capital expenditure, consumers' willingness to pay higher prices for faster internet may be limited. For this reason, telecommunication enterprises should not rely only on traditional mobile tariffs. They need to develop new services, such as IoT, cloud solutions, fixed wireless access, smart home services, and private industrial networks.

The third challenge is regulatory and market readiness. The success of 5G depends on spectrum allocation, competition policy, cybersecurity rules, and digital infrastructure development. Without proper regulatory support, telecom companies may face difficulties in expanding 5G networks and creating new business models.

At the same time, 5G creates important opportunities. It can support digital transformation in manufacturing, transport, agriculture, healthcare, education, and public services. This means that telecom companies can become not only communication providers, but also key participants in the digital economy.

The analysis shows that telecommunication enterprises should consider 5G as a strategic investment rather than merely a technical upgrade. To improve economic performance through 5G, companies need to focus on several practical directions.

First, telecommunication enterprises should expand 5G coverage in areas with high demand, including large cities, industrial zones, business centres, and transport corridors. Second, they should develop B2B services based on private networks, IoT, and cloud platforms. Third, telecom companies should use artificial intelligence and big data to improve network management and customer service. Fourth, cooperation with banks, e-commerce platforms, logistics companies, and public service providers can help telecom operators create integrated digital ecosystems.

Overall, the results show that 5G technologies can improve the economic performance of telecommunication enterprises by increasing network efficiency, expanding revenue sources, reducing operational costs, and improving customer experience. However, the full economic effect of 5G can be achieved only when infrastructure investment is combined with an effective business strategy, digital service development, and customer-oriented management.

## CONCLUSION AND RECOMMENDATIONS

The study shows that 5G technologies play an important role in improving the economic performance of telecommunication enterprises. Unlike previous generations of mobile networks, 5G is not only a tool for increasing internet speed, but also a strategic technology that creates new opportunities for revenue growth, operational efficiency, service quality improvement, and digital business development. The analysis confirms that 5G can influence the economic performance of telecommunication companies through four main directions: increasing network capacity, diversifying revenue sources, reducing operational costs, and improving customer experience.

The results of the study indicate that the economic benefits of 5G depend not only on infrastructure deployment, but also on the ability of telecommunication enterprises to develop new business models. In particular, private 5G networks, IoT solutions, fixed wireless access, cloud services, smart city platforms, and industrial digital services can become important sources of additional income for telecom operators. At the same time, high investment costs, monetisation challenges, and regulatory issues remain the main barriers to the full realisation of 5G potential.

Based on the research results, the following recommendations have been developed:

Telecommunication enterprises should consider 5G as a strategic investment, not only as a technical network upgrade. Companies need to align 5G deployment with long-term business strategy, revenue growth, and service diversification.

Telecom operators should expand 5G coverage in economically active areas, including large cities, industrial zones, business centres, transport corridors, and areas with high data traffic. This approach can increase the return on investment and improve service quality.

Companies should develop new 5G-based services for corporate customers. Private networks, IoT platforms, cloud solutions, smart manufacturing, digital healthcare, and logistics services can create new revenue streams and reduce dependence on traditional mobile tariffs.

Artificial intelligence and big data should be used in 5G network management. These technologies can help optimise traffic, prevent technical failures, reduce maintenance costs, and improve service reliability.

Telecommunication enterprises should strengthen cooperation with banks, e-commerce platforms, logistics companies, industrial enterprises, and public service providers. Such partnerships can support the creation of integrated digital ecosystems based on 5G infrastructure.

Regulatory support is necessary for effective 5G development. Governments and regulators should ensure transparent spectrum allocation, cybersecurity requirements, investment incentives, and fair competition conditions in the telecom market.

Telecom companies should focus on customer experience. High-speed internet, low latency, stable connectivity, flexible tariffs, and digital customer service should be considered key factors of competitiveness in the 5G era.

In conclusion, 5G technologies can become a powerful factor in improving the economic performance and competitiveness of telecommunication enterprises. However, the full economic effect of 5G can be achieved only when technological modernisation is combined with an effective investment policy, innovation management, digital service development, and a customer-oriented business strategy.

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