

## Prospects for the Application of Innovative Technologies in the Provision of Digital Services in Uzbekistan

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**Abstract:** The digital services sector in Uzbekistan has become one of the most important drivers of economic development in recent years. The acceleration of digitalization processes is expanding the scope of services in such areas as public administration, telecommunications, finance, education and healthcare, increasing their speed and quality. In particular, the introduction of innovative technologies is replacing traditional service delivery models with data-driven, automated and customer-oriented approaches, strengthening the institutional foundations of the digital economy.

**Keywords:** Innovative technologies, digital services, telecommunications.

In this regard, the use of artificial intelligence, cloud computing, big data analytics, robotic processes and digital platforms determine the promising development directions of the digital services market in Uzbekistan. These technologies not only reduce the cost of services and increase operational efficiency, but also create the basis for the formation of new digital products and business models. Therefore, the issue of deep integration of innovative technologies into the provision of digital services is of urgent scientific and practical importance in terms of ensuring the country's long-term economic competitiveness.

In studies aimed at reducing the cost of digital services, the need to determine not only the average relationship, but also the gap between potential opportunities and real results is taken into account when choosing an econometric model. In the telecommunications sector, costs are not always formed at the minimum technological level, since organizational, institutional and management factors can prevent the full use of available resources. Therefore, the selected model should allow determining not only the impact of costs, but also the level of inefficiency.

The second important criterion is the multidimensionality and time-area combination of the data. If the study covers several years (2020–2025) and several service areas or regions, then simple regression models will ignore hidden factors. This can lead to misinterpretation of the true sources of cost reduction. Therefore, the model is required to simultaneously take into account the dynamics over time and the specific characteristics of the facility.

The third criterion is the degree of applicability of the model results to management decisions. Strategic decisions on cost reduction should answer not only the question “which factor affects”, but also the question “how effectively are we using our capabilities”. In this regard, models that identify the efficiency limit and compare real activity with this limit will have an advantage from a scientific and practical point of view.

The stochastic frontier analysis model was first developed in 1977 by Aigner, Lovell and Schmidt, as well as Meeusen and van den Broeck, and its main goal was to distinguish between

technical efficiency and inefficiency in the production or cost process. Later, this model was adapted for time series and panel data and began to be widely used in the energy, transport and telecommunications sectors of the economy. An important feature of the model is that it separates random shocks from real management failures as separate components.

The advantage of the Panel SFA model in this study is that it allows comparing the cost of digital services with a theoretical minimum level. In the case of Uzbektelecom, this approach serves to identify cost reduction reserves that can be achieved through digitization, automation and energy efficiency. While simple regression shows the average trend of costs, Panel SFA reveals exactly where and how much inefficiency exists, which is of particular importance for practical management.

The results obtained within the framework of this study show that Uzbekistan offers a fundamentally different, systematic and scientifically based solution to the issue of reducing the cost of digital services from the traditional cost-cutting approach. In particular, the consistent decrease in the ETTK indicator in 2026–2031 proves that the ratio between energy and traffic has become not an intuitive management, but an economic process that is predicted in advance based on a logarithmic trend. This situation scientifically substantiates that energy efficiency in digital infrastructures is not just a technical problem, but a controllable factor that directly provides economic results.

The impact of automation on costs, determined through ATYI forecasts, shows that digital transformation is not limited to technological modernization alone, but is fundamentally reshaping the structure of labor costs. The fact that ATYI is higher than 1 and growing in the study proves that automation processes are moving beyond formality and are providing real economic benefits. This result is fully consistent with the concept of the “automation dividend” noted in international experience (OECD, ITU) and is confirmed by empirical evidence in the conditions of Uzbekistan.

The accelerating growth trajectory of the IMSTK indicator clarifies existing theoretical views on investment efficiency. The results of the study show that, although CAPEX directed at digital infrastructure initially has a slow effect, over time the cost-reducing power of each investment unit increases. This is a practical confirmation of the theories of technological maturity and learning curve, and is an empirical proof that is rarely found in dissertation research.

The downward dynamics of UTYK forecasts reveals the relationship between service quality and cost at a new level. The study modeled outages and poor-quality services not only as a source of customer satisfaction, but also as a direct source of economic loss. The consistent reduction in UTYK through AI monitoring and predictive management scientifically proves that quality indicators are now an inseparable category from financial results in the digital services economy.

The results of logarithmic regression and trend-based forecasting showed a stable downward trajectory of the ETTK indicator in 2026–2031. These forecasts scientifically confirm that the process of reducing the cost of digital services is not accidental, but a long-term result of deep structural changes and innovative management decisions.

The fact that the estimated real cost indicators, taking into account the inflation factor, remain below 1 indicates that the cost reduction is due to real efficiency, not nominal. This fact confirms the consistency between the statistical stability and economic content of the developed model and increases the reliability of the research results.

The developed innovative organizational and economic mechanism forms a comprehensive approach to the problem of reducing the cost of digital services. The proposed model and forecast results serve as a solid scientific and practical basis for making strategic decisions in the process of digital transformation of Uzbektelecom JSC and fully confirm the scientific novelty and practical significance of the research work.

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