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MECHANISMS FOR IMPROVING THE EFFICIENCY OF UZBEKISTAN'S ECONOMY IN THE CONTEXT OF DIGITAL TRANSFORMATION

Ramazonova Sevinch Faxritdinovna
Second-year student, Bukhara State Technical University, Uzbekistan

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Abstract. This article looks at how Uzbekistan can turn digital transformation into measurable gains in economic efficiency. Digital tools are spreading quickly across the country, from online public services to mobile payments and a growing IT export sector, yet adopting technology does not by itself make an economy more productive. The study examines the channels through which digitalization affects productivity, transaction costs, transparency and competitiveness, and then identifies the obstacles that still hold the process back: uneven digital infrastructure between regions, a shortage of skilled specialists, shallow digital adoption among small and medium-sized enterprises, fragmented public data systems and growing cybersecurity risks. Drawing on a systematic and comparative reading of national strategic documents and international research, the article proposes five complementary groups of mechanisms: institutional and legal, infrastructural, human capital, financial and investment, and sectoral digitalization. The central argument is that these mechanisms work as a system rather than as separate policies. The conclusions may be useful to policymakers, researchers and business leaders who are shaping digital economy strategies in Uzbekistan and in comparable emerging economies.

Keywords: digital transformation; digital economy; economic efficiency; Uzbekistan; e-government; human capital; fintech; digital infrastructure; small and medium-sized enterprises; cybersecurity

1. Introduction

For most of the last century, economic growth was explained mainly by two things: how much labour a country could put to work and how much capital it could invest. That picture has changed. Data, algorithms and digital platforms now sit alongside land, labour and capital as real inputs to production, and Klaus Schwab (2016) has argued that the resulting fourth industrial revolution is reshaping how goods are made, how organizations are run and how people consume. For a country trying to move up the value chain, digital transformation is therefore less a matter of buying new equipment than a question of long-term competitiveness.

Uzbekistan has taken this idea seriously. Over the past several years the government has pushed ahead with the modernization of the economy, the digitalization of public services, the growth of the IT sector and the spread of electronic payments. The Digital Uzbekistan–2030 strategy was approved by Presidential Decree No. PF-6079 of 5 October 2020, and the broader Uzbekistan–2030 strategy followed under Decree No. PF-158 of 11 September 2023. Both documents treat digital technologies as one of the main drivers of future growth.

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Still, installing technology and benefiting from it are two different things. In 1987 the economist Robert Solow remarked that the computer age could be seen everywhere except in the productivity statistics (Solow, 1987). The observation, often called the productivity paradox, remains relevant today. It reminds us that technology pays off only when institutions, skills and business processes change along with it. The purpose of this article is therefore to identify and justify the mechanisms that can convert digital transformation in Uzbekistan into real gains in economic efficiency.

The study pursues three tasks. It first clarifies the theoretical link between digital transformation and economic efficiency. It then reviews the current state of the digital economy in Uzbekistan and the problems that remain. Finally, it develops a practical set of mechanisms for raising efficiency.

2. Literature Review and Methodology

The idea of a digital economy entered academic debate in the mid-1990s, when Don Tapscott (1995) described a new economic system built on networked information technology. Later, Brynjolfsson and McAfee (2014) showed that digital technologies change how value is created, because they allow products to be copied at almost no cost and make it possible to serve new customers with very little extra spending. International organizations have added an institutional angle. Research by the OECD (2020) and the United Nations (2022) suggests that digital public administration can make government more transparent, reduce opportunities for corruption and improve conditions for entrepreneurs.

This article relies on a systematic approach, comparative analysis, logical generalization and the review of normative and strategic documents. Efficiency is treated as a concept with three dimensions. Economic efficiency refers to labour productivity and the way resources are used. Institutional efficiency concerns the quality of public administration, including the speed and transparency of services. Social efficiency reflects how easily people can access services and what that means for their quality of life. Looking at all three together helps avoid the common mistake of measuring digital progress only by the number of systems launched.

3. How Digital Transformation Affects Economic Efficiency

Digital transformation affects efficiency through several connected channels. The most visible one is the reduction of transaction costs. When documents move electronically, when businesses can register online and when payments are made remotely, both citizens and firms save time and money, and many bureaucratic obstacles simply disappear.

A second channel is labour productivity. Automation, cloud computing and artificial intelligence can take over repetitive tasks, which lets employees spend more of their time on work that requires judgment and creativity. A third channel is market access. E-commerce platforms allow a small producer in a regional town to reach customers well beyond the local market, including buyers abroad, something that used to require a large sales network.

The fourth channel concerns the quality of decisions. Analysis of large data sets gives managers and officials a clearer view of demand, costs and risks, so plans become more accurate and fewer

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resources are wasted. The fifth channel is trust. Digital public services, electronic procurement and online tax administration leave a visible trail of every transaction, which reduces room for corruption and makes the country a more attractive place to invest.

4. The Current State of Digital Transformation in Uzbekistan

Uzbekistan has made noticeable progress in several areas. Public services are increasingly available through the unified portal my.gov.uz and through public service centers, so that many procedures which once demanded several visits to different offices can now be completed online. Payment systems such as Uzcard, Humo, Payme and Click have expanded cashless settlements and made mobile banking a part of everyday life for many people.

The IT sector has also received strong state support. Tax and customs benefits for IT Park residents have encouraged software development and exports, while programs such as One Million Uzbek Coders aim to train a new generation of specialists. In taxation and customs, electronic invoices, online cash registers and digital tax platforms have simplified administration. Universities, for their part, are introducing electronic learning platforms and distance education formats.

These achievements are real, but they do not yet amount to a full transformation. Behind the visible successes a number of structural problems remain, and they explain why digital progress has not always translated into higher efficiency.

5. Key Challenges

The first problem is digital inequality. Internet speed and quality differ considerably between cities and rural areas, and between the capital and more remote regions. A business in a well-connected district and a similar business far from the main networks simply do not operate under the same conditions.

The second problem is a shortage of qualified personnel. Demand for programmers, data analysts and cybersecurity experts exceeds supply, and there is a constant risk that talented graduates will move abroad in search of better pay. A related difficulty is the low level of digitalization among small and medium-sized enterprises. Many of them use digital tools only for payments and communication, while production, accounting and management still run on paper or on disconnected spreadsheets.

Data fragmentation is another obstacle. Information systems of different agencies are not always connected, so citizens and firms are sometimes asked to submit the same information more than once. At the same time, the wider use of digital services raises the stakes for cybersecurity and for the protection of personal data, since a single breach can undermine public confidence in the whole system. Finally, digital literacy is uneven. Older people and residents of remote areas often cannot use online services fully, which means that the benefits of digitalization are not shared equally.

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6. Mechanisms for Improving Economic Efficiency

The analysis above suggests that no single measure can solve these problems. What is needed is a set of five connected groups of mechanisms, each addressing a different weakness and each depending on the others.

6.1. Institutional and legal mechanism

The first group is institutional and legal. A modern digital economy needs clear and regularly updated rules on personal data, digital assets and electronic commerce. Regulatory sandboxes, in which fintech companies and artificial intelligence start-ups can test new products under supervision, would help the country encourage innovation without exposing consumers to unnecessary risk. Equally important is interoperability between government information systems. If the once-only principle is firmly applied, so that citizens and firms provide each piece of information to the state just once, duplication falls and public services become faster. To make sure these reforms deliver, the government should also set clear performance indicators and monitor results regularly rather than reporting only on the number of services moved online.

6.2. Infrastructure mechanism

The second group concerns infrastructure. Reliable broadband, including 5G and fibre-optic networks, has to reach remote districts as well as large cities, otherwise digital services will keep widening regional gaps. The country also needs data-processing centers and a national cloud infrastructure that can host public and commercial systems securely. Electronic identification, digital signatures and a single authentication system should be usable across all services, so that people do not have to maintain a different login for each of them. Strong cybersecurity centers and a well-prepared incident response system complete this layer, because trust is part of infrastructure too.

6.3. Human capital mechanism

The third group is human capital, which is probably the most decisive of all. Technical universities, including Bukhara State Technical University, can adapt their curricula to the needs of industry by giving more space to artificial intelligence, data analysis, cybersecurity and the Internet of Things. Cooperation between universities, businesses and the state, through internships, joint laboratories and hackathons, would give students practical experience before graduation. Existing employees also need opportunities for reskilling and upskilling, and the wider population needs basic digital literacy training. Finally, if the country wants to keep its most capable specialists, it must offer working conditions and career prospects that can compete with those available abroad.

6.4. Financial and investment mechanism

The fourth group is financial and investment. Venture capital, start-up ecosystems and technology parks need continued support so that new ideas can find funding. Small and medium-sized enterprises, which are the weakest link in the current picture, would benefit from preferential loans, grants and tax incentives that are tied specifically to digital upgrades, such as accounting software, e-commerce channels or automated production tools. Public-private partnerships can share the cost and risk of large digital infrastructure projects, and closer cooperation with foreign technology companies

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and international financial institutions can bring in capital, experience and standards that are hard to build alone.

6.5. Sectoral digitalization mechanism

The fifth group is sectoral digitalization, which brings the other four mechanisms into real economic activity. In manufacturing, sensors and Internet of Things solutions can monitor production, cut waste and improve quality in line with the ideas of Industry 4.0. In agriculture, satellite monitoring and precision farming can help use scarce water and land more wisely, a point of particular importance for Uzbekistan. In transport and logistics, electronic freight documents, GPS tracking and route optimization lower delivery costs. In energy, smart meters and data analysis improve grid management. In education and health care, digital learning resources, electronic medical records and telemedicine can extend quality services to people who live far from major centers.

7. Expected Results

If these mechanisms are carried out consistently, the expected results are fairly clear: less time and money spent on administrative and business procedures, higher labour productivity, stronger export potential, better quality jobs, smaller differences between regions and a more attractive investment climate. The most important point, however, is that the mechanisms must reinforce one another. Services without infrastructure cannot reach people, technology without skilled staff stays unused, and investment without a sound legal framework rarely delivers the expected return.

8. Conclusion

The study shows that digital transformation is an important but not a sufficient condition for improving the efficiency of Uzbekistan's economy. Its real effect depends on whether the introduction of technology is accompanied by institutional reform, better infrastructure, higher-quality human capital and the practical digitalization of key sectors. The five mechanisms proposed in this article (institutional and legal, infrastructural, human capital, financial and investment, and sectoral) offer a systematic framework for turning national strategies into concrete results.

The article has limits. It relies on documentary and comparative analysis and does not test the proposed mechanisms with quantitative data. Future research could therefore measure the regional and sectoral effects of digitalization with econometric models, using official statistics, and could examine which of the five mechanisms produces the largest gains in practice.

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