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# Global Experience in Ensuring The Balance Between Economic Digitalization and The Precesses of Social Reproduction

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**Abstract:** Digitalisation has been at the forefront of the global economic engine, changing the landscape of production, services, and governance systems. This study explores the balance of economic digitalization with social reproduction processes in Uzbekistan, taking examples from China, Singapore, the United States, India and South Korea. While rapid advances are being made, one important knowledge gap persists around how digital transformation is linked to equitable social and economic development.

The study applies a comparative descriptive approach and, based on global datasets, governmental documents and industry statistics, assesses the digital transformation of Uzbekistan in the years 2017-2024. The findings showed that the share of the digital economy in GDP doubled from 0.5% of GDP in 2005 to 17% of GDP in 2024, mainly due to the strategy "Digital Uzbekistan 2030", the automation of industries, and the growth of the IT industry. Service and industrial sectors recorded high levels of digitalization at 85 per cent and 78 per cent respectively; agriculture, however, recorded 30 per cent.

Findings asserting that digitalization enhances productivity, innovation, and resource utilization and alters economic and social structures. But this must be tempered with the caveat of sectoral and local differences creating a need for inclusive policy approach and regional digital expansion. Yes, building better infrastructure, providing more support for SMEs and raising digital skills are key items to sustain growth. The paper argues that for Uzbekistan to become an innovation-driven, sustainable digital economy, the mutual socio-technical development has to be synchronized.

**Keywords:** Digital economy; economic digitalization; social reproduction; labor productivity; innovation; Industry 4.0; Uzbekistan; technological transformation.

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## 1. Introduction

In the modern global economy, digitalization has become a fundamental factor shaping sustainable growth and competitiveness. Digital technologies have penetrated nearly every sphere of economic and social life, creating new opportunities for innovation, efficiency, and inclusion. The integration of technologies such as the Internet, big data analytics, artificial intelligence, and cloud computing has redefined how value is created, distributed, and consumed across economies.

Recognizing the digital economy's ability to increase productivity, lower transaction costs, and promote diversification, Uzbekistan has elevated the development of the digital economy as a national strategic priority. The «Digital Uzbekistan – 2030» states strategy of the country, the formation of the Unified Interactive Public Services Portal (my. This is evident from the establishment of IT Parks, the development of e-government services

through the Internet portal (gov.uz) etc., which is repeated as a bugle call to build a knowledge-based and innovation-driven economy [1]. These initiatives seek to digitize key areas of the economy by 2025, so that digital transformation can be compatible with traditional production processes.

In addition, the COVID-19 crisis has further catalysed the transition to digitalization, showing how essential digital technologies are to ensure the continuity of economic and social activity. Digital transformation now stands among the strategic actions to modernize society, lead to a higher competitive level of the economy, and guarantee sustainable development. Digitization is changing production processes with automation, data-based decision making, digital logistics, and new business models. This, in turn, impacts every level of social reproduction — in terms of production, distribution, exchange, and consumption — thus resulting in a reconfiguration of the equation between technological change and socio-economic change.

## 2. Materials and Methods

The approach that has been adopted by this study revolves around comparative analysis to show the connection between economic digitalisation and social reproduction process in Uzbekistan based on the best world practice. This research uses both qualitative and quantitative techniques to reflect its holistic approach. Statistical data was drawn from national official sources, e.g., Uzbekistan State Statistics Committee, as well as international databases such as the World Bank, IMF and OECD Digital Economy Outlook. To identify trends and progress indicators, governmental reports, strategic documents (including the program "Digital Uzbekistan – 2030"), and sectoral studies were also examined. The study draws on a comparative analysis of experiences of some leading economies that were able to harmonize technological transformation with socio-economic development China and Singapore, the United States, India, and South Korea. Through comparison of their practices, important policy trends and examples of success were conducted for adaptation into the Uzbekistan context. Extensive quantitative assessment was performed by computing shifts in GDP structure, composition of digital economy, internet penetration, IT service export figures and the extent of sectoral-level digitalization between 2017 and 2024. The qualitative assessment of how the digital transformation has impacted sector structure and the social dimensions of the digital economy, including the labour market, innovation, and productivity growth. The triangulation approach was taken to validate findings of different data sources in order to objectively and reliably obtain them. This integrated approach also enabled the identification of the causal relationships between digitalization policies and socio-economic outcomes. In summary, this approach offers a systematic structure for evaluating the efficiency, inclusiveness, and sustainability of Uzbekistan digital transformation compared to the world best practice.

## 3. Results

The international experience shows that proper structural changes in order to digitization will only appear if balance is found between technological development and the processes of social reproduction. In contrast, nations that have successfully-termed past the digital transformation bittersweet into their socio-economies like China, Singapore, the USA, India, and South Korea- have reached a sound degree of productivity, innovation, and economic resilience. Their experiences can offer important lessons for Uzbekistan as it implements its digital development strategy.

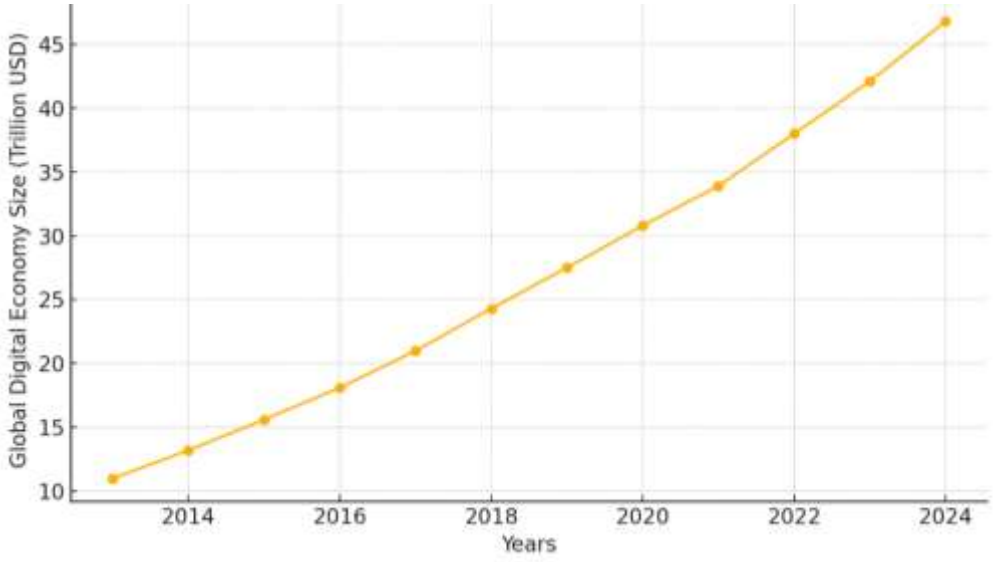



**Figure 1.** Global Digital Economy Growth (2013-2024) [2]

In the next chart, we can see how the global digital economy has been growing consistently and significantly since 2013, and is still expected to grow until 2024. On the other hand, the global digital economy grew in value from USD 11 trillion in 2013 to nearly USD 46.8 trillion in 2024; more than fourfold expansion over this period. The increase is also a testament to the speed of digital transformation in developed and developing nations alike.

This growth has mainly been supported by the rapid penetration of information and communication technologies (ICT), e-commerce, cloud computing, artificial intelligence (AI), and digital financial services. They transformed conventional production, distribution, and service systems, leading to elevated productivity and global economic interlinking [3].

Digitalization is a key pillar of higher GDP per hour worked, industrial modernization in China China has experienced a development path characterized by transformation from imitative to independent innovation with its own logic of digitally economic development and unique Chinese model since it connected to the Internet in 1994. The scale of digital economy value added in China rose from 11 trillion yuan in 2012 to 50.2 trillion yuan in 2022, and the digital economy value added accounted for 41.5% of GDP over the period, up from 21.6%, according to the China Academy of Information and Communications Technology (CAICT)

The technologies underlying this transformation from the industrial revolution to industry 4.0 — digital technologies such as big data, artificial intelligence, and cloud computing — have come to permeate industrial processes to make timely decisions and optimize resources [4]. Support for this progress has come from the Chinese government, many% or these kinds of policies are the China Internet Investment Fund (CIIF) and the Plan for Opening Up the Service Sector (2025), each focusing on attracting funding to electronic services.

Since 2013, a general upward trend has been observed in the development of the global digital economy. China, the United States, and Europe have formed a three-tier structure within this process. China's digital economy has consistently ranked second in the world in terms of scale. The rapid growth of China's digital economy and its increasing position in international competition have accelerated its transition to a new stage — one characterized by deeper application, standardized development, and inclusive integration [5].

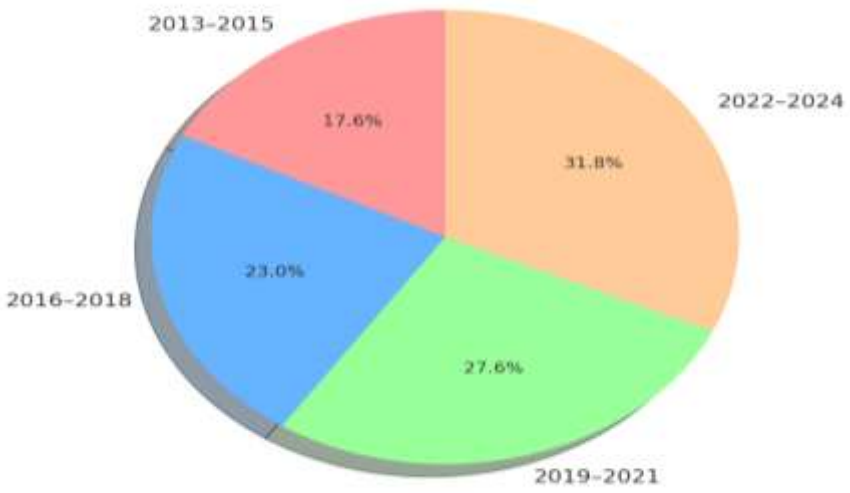



**Figure 2.** China's Digital Economy Share of GDP (2013-2024) [6]

The pie chart shows the percentage growth of China's digital economy as part of GDP during four periods: 2013-2015, 2016-2018, 2019-2021, and 2022-2024. The findings bring about a confirmation of a sustained and robust positive trend in the incorporation of digital technology into the national economic activity.

In the early stages of infrastructure and policy development (2013–2015) the digital sector made up approximately 17.6% of the total digital sector contribution. The proportion reached 23% by 2016–2018, with the acceleration of "Internet Plus" strategy and high speed in digital platform applications [7].

2019–2021 is a key stage of digital maturity, accounting for 27.6% of the total. Fueled by the rapid acceleration of cloud computing, e-commerce, and mobile payment systems, and the digital activation of the COVID-19 pandemic. And in 2022–2024 which should be considered the consolidation stage for China's global position as the second bourgeois: The digital economy share, reached the peak — 31.8%.

In summary, the chart highlights the structural transformation of China's economy from manufacturing to technology innovation driven economic model. The steady growth highlights the strategic triumph of national initiatives like Digital China and Made in China 2025, which have made digitalization the engine of sustainable economic growth.
Data are a strategic asset rather than a by-product of the economy - as China has discovered through experience. Examples of enhancing data collection, storage, and analytics systems to raise productivity in agriculture, industry, and services - and bold actions taken to establish a modern data infrastructure platform to provide such information - are highly relevant to Uzbekistan [8].

Of all the Asian digital economies, Singapore has perhaps the most advanced one. The digital economy surpassed finance and insurance to contributed 17.7% of GDP in 2022. Digital transformation has also yielded substantial benefits for the manufacturing sector, which includes semiconductors and biomedical industries.

Singapore's manufacturing sector recorded a growth rate of 5.1per cent in 2024. In manufacturing, especially, chip (semiconductor) manufacturing performed extremely well. Semiconductor industry based in Singapore today produces 7% of GDP Digitalization has brought great success for the electronics and biomedical industry in Singapore. Companies like NXP Semiconductors and Vanguard International Semiconductor Corporation pouring tens of billions of dollars into new plants there, for example. This shows how digitalization has come to be incorporated in production processes and translate into economic growth.

A significant driver of this advancement is small and medium-sized enterprises (SMEs), with 94.6% of Singaporean SMEs utilising one or more digital solutions by 2023.

The digitisation drive, alongside the government's assistance schemes via initiatives like the Enterprise Compute Initiative, SkillsFuture grants and tax incentives have made digital adoption and workforce upskilling attractive on a large scale.

The strategy in Singapore focuses on digital-critical synergy across the digital and manufacturing sector - automation and data analytics, along with supply chain optimization, are critical to maintaining high productivity [9]. Developing comparable incentives for Uzbekistan digital transformation grants for SMEs, subsidized digital solutions, and public-private collaborations via technology parks would support faster national digitalization and ultimately increase the national economy competitiveness.

The United States remains a global leader in digital innovation. As of 2025, the digital economy is valued at $4.9 trillion, accounting for 18% of GDP and generating over 28 million jobs. U.S. policies promote technological advancement, regional innovation, and the strengthening of digital infrastructure [10].

The U.S. Department of State has developed the Digital Government Strategy (2021–2025). This strategy is aimed at modernizing public services through open data, digital services, and technological innovations. This approach seeks to provide citizens with convenient and efficient public services [11].

Notably, these big initiatives encompass the Digital Government Strategy (2021-2025) for open data, e-services, and public administration technological modernization and the CHIPS and Science Act (2022), aimed at expanding semiconductor fabrication and creating 31 regional «Tech Hubs».

The U.S. experience could offer several lessons to Uzbekistan: development of regional digital innovation centers, promotion of open government data platforms, and integration of e-governance tools to promote transparency and efficiency of service delivery [12]. Establishing technology hubs and training programs for digital services will also help in consolidating building blocks of the digital era.

This initiative, Digital India launched in 2015, has brought enormous change in all the areas of Indian economic and administration. This is based on three main components: building the digital infrastructure, implementation of government services online and digital capacity building.

The network of e-services, financial platforms, and digital identity systems has opened access to millions, powered by projects like Aadhaar, BharatNet, UMANG, DigiLocker, and BHIM UPI. Likewise, the Make in India program has stimulated industrialisation and foreign investment, and the Startup India maneuver propped entrepreneurship with tax breaks and incubation centers [13].

The manufacturing sector is being supported through the "Make in India" program. The main objectives of this initiative are to transform India into a global manufacturing hub, increase the share of manufacturing in GDP, create a favorable environment for the private sector and foreign investors, promote local production, expand export volumes, create new jobs, and introduce technological innovations. As a result of the "Make in India" program, the volume of foreign direct investment (FDI) entering India has increased significantly since 2014. Notable growth has been observed in sectors such as electronics, automobile components, and mobile phone manufacturing [14].

India provides some lessons for Uzbekistan: a national ID system, rollout of broadband in rural areas, and local manufacturing linked to digital may be new forms of infrastructure that support matching production to digital and enhancing inclusive growth for the country.

Major tech firms such as Samsung, LG and SK Group operate in South Korea, which features one of the most sophisticated digital infrastructures globally. Artificial intelligence, data-driven governance, and smart factories are key priorities for the government's Digital New Deal and the Digital Government Master Plan (2021-2025).

At this point, the country had committed ₩9.4 trillion (≈$6.9 billion) to be spent by 2024 on AI technologies, semiconductor technology, and advanced connectivity (5G–6G).

Foreign startups were also drawn to the program, which provides grants and tax benefits under the K-Startup Grand Challenge program.

The Korean experience shows that strengthening the systemic context with coordinated governmental support, advanced and future-ready digital infrastructure, and highly skilled human capital is the recipe for successful digital transformation. Uzbekistan also can adopt similar policies — developing regional technology nodes, training AI and cyber specialists, and creating fiscal and research incentives to stimulate innovation.

All five country analyses suggest that digitalization increases productivity, improves resource allocation, and contributes to green economic growth. But it must balance technology with social reproduction — ensure that labor markets, education and welfare evolve in tandem with technology [15]. In sum, while Uzbekistan needs to integrate these lessons, the important thing for the country is to consolidate the synergies between digital transformation and the larger socio-economic reproduction process.

Uzbekistan's industrial sector has grown at a steady pace over the period from 2017 and 2024, rising from 27% of GDP to 33%. The expansion is a testament to thriving modernization initiatives, adoption of Industry 4.0 technologies and digital automation in dominant manufacturing sectors.

Adoption of smart production systems and digital monitoring platforms led to resource efficiency and improved export potential. Rest today: industrial recovery in the post-pandemic period (2020-2022) on import substitution and localization policies. Thus, the increasing industrial share signifies not only technological advancement but also the growing influence of digital transformation on industrial productivity and national output.

In comparison, the agriculture sector's share of GDP fell from 24% in 2017 to 18% in 2024. That does not mean stagnation but represents a structural shift of the national economy, as the share of both industry and services grows faster.

But agricultural output in absolute terms remained beneficial due to digital developments like smart farming systems, drone-based irrigation, and sensor-assisted monitoring.

And yet still, the slow adoption of digitalization in agriculture has so far, hampered progress in these areas. During this, the answer lies in huge investments in the agro-digital foundation, for which information stages and devices for the optimized allocation of resources by ai.

GDP Services Sector Gainer The services sector is the largest component of GDP. That existed during 2017–2024 with a share fluctuating by 41% to 45%. This was mainly due to COVID-19 restrictions that hit tourism, retail and transport between 2020 and 2021, causing a temporary decrease in the data.

Starting 2022, rapid recovery was supported by digital technologies – primarily e-commerce, online banking, and logistics platforms.

The advancement of facilities has created new employment possibilities, enhanced the reach to consumers, and also established brand-new company models with digitalisation within solutions. As a result, the service sector has been at the very heart of Uzbekistan’s digital economy.

Uzbekistan’s GDP between 2000 and 2024 was characterized by balanced and sustainable growth and increased from 20 trillion soums in 2000 to 880 trillion soums in 2024 an increase of over 44 times. Creative displacement of previous industries characterized the first growth time (2000-2010) and the second growth phase (2016-2024) was a base for macroeconomic reforms based on digitalisation and foreign investments.

Even during the pandemic, Uzbekistan maintained a positive growth trajectory, underscoring the resilience of its economy. The integration of digital technologies has enhanced not only quantitative growth but also qualitative transformation, promoting diversification and innovation-led productivity.

From 0.5% in 2005 to 17% in 2024, the share of the digital economy in Uzbekistan's GDP increased steadily. Note that the greatest acceleration happened after 2017, which is when the «Digital Uzbekistan – 2030» strategy was adopted [16]. Over the past two years, digital sectors have more than doubled their contribution to the national economy thanks to the rapid growths in IT infrastructure, e-commerce, fintech, and digital public services.

This trend was given additional impetus by the COVID-19 pandemic, which accelerated demand for remote service delivery, online commerce, and digital financial solutions.

Therefore, the digital economy has emerged as a strategic driver of sustainable economic growth.

Exports of IT services from Uzbekistan jumped from US$50 million in 2017 to US$620 million in 2024 – increase by almost twelve times.

Such growth is associated with the launch of the IT Park Uzbekistan (2019) and its regional branches to ensure infrastructure, tax preferences, and training in software development and outsourcing services. Since 2021, the rapid growth of the digital sector led to an expansion of exports to the US, European and Middle Eastern markets, consolidating its role in the foreign exchange earnings of the Republic and making Uzbekistan an IT hub of Central Asia.

The share of Internet users increased from 45% in 2017 to approximately 90% in 2024 this figures demonstrates the pace of development of the digital infrastructure and mobile communication in the country. It is made possible by investments in broadband networks, fiber-optic communication, and 4G/5G technologies, which have enabled this growth. Widespread access to the internet has sped-up the flow of information, improved citizens access to e-services, and promoted digital literacy — ultimately laying a stronger underpinning for the digital economy.

Sectoral analysis shows different levels of digitalization:

**Services:** from 35% in 2017 to 85% in 2024

**Industry:** from 20% to 67%

**Agriculture:** from 10% to 46%

These contrasting figures underscore the discrepancy in sectors by way of spread of infrastructure, spread of investment and spread of HC capacity. While services have taken the first lead in digital move, industry and agriculture are catching up, with government support programs and modernization of technologies enablers for these sectors. This is all part of gradual yet systematic economic transformation of Uzbekistan toward digital economy.

The total scale of electronic payments increased tremendously from 5 trillion soums in 2017 to 70 trillion soums in 2024 - 14 times growth. This increase comes from the rapid evolution of mobile banking, online business, and digital payment platforms. The trend also shows more confidence on the part of the public in financial technology and the achievement of regulatory reforms, in the areas of conversion of a cashless economy. Digital transactions generate greater fiscal transparency, faster circulation of money and more extensive economic formalization.

In itself, 85% of service corporations, 78% industrial agencies, and 30% agricultural agencies have been virtual by 2024. This trend attests to the growing adoption of ICT solutions, automation systems and data analytics into business operations. But the government needs to do more to help smaller, rural firms - through subsidies, training and infrastructure.

In total, the results indicate a high contribution of digitalization in Uzbekistan from 2017 until 2024 with productivity, innovation and structural stability experiencing considerable improvement.

Digital economy is emerging as the new engine of growth for the economy, leading to higher productivity in production, distribution and consumption processes. However,

equitable digitalisation, especially in agriculture and in many regional areas, is still important to facilitate balanced and sustainable social reproduction.

## 4. Conclusion

Between 2017 and 2024, Uzbekistan's economy has undergone a profound digital transformation, reshaping production structures and social reproduction processes. Digital technologies have enhanced productivity, reduced costs, and improved resource efficiency across all sectors. The industrial and service sectors, in particular, have shown strong growth due to the integration of automation, data analytics, and online services. Meanwhile, agriculture is gradually adopting smart farming systems and digital management tools.

The share of the digital economy in GDP has risen sharply, supported by the expansion of IT services exports, electronic payments, and internet accessibility. These developments confirm that digitalization is becoming a key engine of sustainable economic growth. To ensure balanced progress, Uzbekistan must further strengthen its digital infrastructure, promote innovation in all regions, and enhance digital skills within the workforce. This balanced approach will secure the alignment between technological transformation and social reproduction in the long term.

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