DIGITAL TECHNOLOGIES AND EMPLOYMENT: THE CASE OF UZBEKISTAN

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Annotatsiya: Ushbu maqolada raqamli texnologiyalarning O'zbekiston mehnat bozoriga ta'siri tahlil qilinadi. Maqsad — raqamli texnologiyalar ish o'rinlarini qanday o'zgartirayotgani, yangi kasb va malakalar talabining shakllanishi hamda mavjud ishchi kuchi qanchalik tayyorligi masalalarini aniqlash. Metodologiya sifatida statistik ma'lumotlar, hukumat siyosatlari, va soha ekspertlarining fikrlari o'rganildi. Tadqiqot natijalari shuni ko'rsatadiki, raqamli texnologiyalar mehnat bozorida yangi imkoniyatlar yaratmoqda, lekin malaka farqlari, infratuzilma muammolari va raqamli savodsizlik kabi to'siqlar ham mavjud.
Kalit so'zlar: raqamli texnologiyalar, ish o'rinlari, yangi kasblar, raqamli savod, O'zbekiston, mehnat bozor.

Аннотация: В данной статье анализируется влияние цифровых технологий на рынок труда Узбекистана. Цель — выявить, как цифровые технологии изменяют рабочие места, формируют спрос на новые профессии и квалификации, а также определить, насколько готова существующая рабочая сила. В качестве методологии использовались статистические данные, государственная политика и мнения экспертов отрасли. Результаты исследования показывают, что цифровые технологии создают новые возможности на рынке труда, однако существуют препятствия в виде различий в квалификации, проблем с инфраструктурой и цифровой неграмотности.
Ключевые слова: цифровые технологии, рабочие места, новые профессии, цифровая грамотность, Узбекистан, рынок труда.

Abstract: This article analyzes the impact of digital technologies on the labor market in Uzbekistan. The objective is to identify how digital technologies are transforming jobs, shaping the demand for new professions and skills, and assessing the readiness of the existing workforce. The methodology includes statistical data, government policies, and industry experts' opinions. The study results show that digital technologies create new opportunities in the labor market, but obstacles such as skill gaps, infrastructure issues, and digital illiteracy remain.
Keywords: digital technologies, jobs, new professions, digital literacy, Uzbekistan, labor market.

Introduction: Digital technologies are a set of technologies that enable the creation, storage, transmission, and processing of data using computers, networks, software, and other digital tools. They are a crucial factor in the modern economy and are driving profound changes across various sectors.

Trends in the Digital Economy in the Global and Central Asian Context
The digital economy is rapidly developing worldwide. Technologies such as the Fourth Industrial Revolution (Industry 4.0), big data, artificial intelligence (AI), and the Internet of Things (IoT) are fundamentally transforming global economic processes. New sectors such as digital services, e-commerce, online education, and telemedicine have emerged.

Countries in Central Asia are also actively participating in this transformation. Efforts are being made in the region to improve digital infrastructure, digitize public services, and train qualified personnel. However, challenges such as digital illiteracy, insufficient infrastructure, and financial constraints remain significant barriers.[1]

Uzbekistan's "Digital Uzbekistan – 2030" Strategy and Other National Documents

The Government of the Republic of Uzbekistan has identified the development of the digital economy as a strategic priority and adopted the **"Digital Uzbekistan – 2030"** strategy. This document aims to widely introduce digital technologies across the country, improve digital infrastructure, expand the scope of digital services, and enhance digital literacy among the population and businesses.

Issue: Does Technological Development Eliminate or Create Jobs?

There is an ongoing debate over whether technological advancement, particularly the implementation of digital technologies, leads to job losses. For instance, automation and artificial intelligence can potentially replace workers engaged in repetitive and routine tasks. This is especially noticeable in areas such as data entry, basic calculations, and standard customer service roles.

However, digital technologies also play a significant role in creating new employment opportunities. In the IT sector, for example, new professions are emerging, such as software developers, data analysts, and cybersecurity specialists. Moreover, digital services, online marketing, digital entrepreneurship, and startups are creating new economic opportunities.

There are also significant changes in labor market skill requirements. Today, even basic-level workers are expected to have strong technical knowledge and digital literacy. Therefore, education and vocational training systems must adapt to meet the demands of modern technologies.[2]

Literature Review: There are numerous scientific studies and reports on digital technologies and their impact on the labor market. This section reviews the key sources at both the national level in Uzbekistan and the international level.

In Uzbekistan, the issue of implementing digital technologies and their effects on the labor market has gained significant attention in recent years. For example, the article titled **"Human Resources and Skills Issues in the Implementation of Digital Technologies in Uzbekistan"**, published by Ecominds Press, provides a detailed analysis of workforce-related challenges arising during digital transformation. The study discusses the workforce's lack of skills in adopting new technologies, the necessity of retraining and upskilling, as well as the emergence of new professions and changes in existing ones.

Similarly, the article **"Transformation of the Consumer Services Sector in Uzbekistan: Analysis of the Impact of Digitalization on Employment and Qualification of Personnel"**, available on the OAJournals platform, analyzes the digitalization process in the consumer services sector and its effect on workforce qualification requirements. The article highlights changes in the number and types of jobs in customer service as a result of digital technology adoption, emphasizing the emergence of new professions and skills.[3]

International Studies: At the international level, the impact of digital technologies on the labor market has been widely studied. Research by organizations such as the OECD, World Bank, and ILO demonstrates that while technologies may eliminate some jobs, they also create new

employment opportunities. For example, the report **"Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation"** details how automation results in the reduction of certain occupations but simultaneously generates new jobs and opportunities.

Moreover, these studies emphasize skill disparities during digital transformation, adaptability to new technologies, and the role of government policies. They highlight the importance of education systems and retraining programs in creating new jobs. Workforce flexibility and the capacity to adopt innovations are identified as key factors differentiating countries in the digital economy.

Both Uzbek and international research indicate that the impact of digital technologies on the labor market is complex and multifaceted. Digital transformation creates new jobs and skills but also brings challenges such as skill shortages, infrastructure limitations, and policy-related barriers. Therefore, cooperation between the government and the private sector, modernization of the education system, and implementation of upskilling programs are crucial for developing the digital economy.[4]

Methodology: This study utilized various data sources and methods to examine the impact of digital technologies on Uzbekistan's labor market.

The main data were obtained from the following official and reliable sources:

1. **The State Committee of the Republic of Uzbekistan on Statistics** – official statistics on the labor market, workforce composition, number and distribution of jobs.

2. **Ministry of Labor and Social Protection of Population** – data on employment, unemployment rates, qualifications, and retraining programs.

3. **Official portals of the Government of the Republic of Uzbekistan** – policy documents, strategies, and updates related to the digital economy and technology implementation.

4. **International organizations** – analyses and reports published by the World Bank, Organization for Economic Cooperation and Development (OECD), International Labour Organization (ILO), and others. These sources provided an international context and comparison.

The following methods were applied in the study:

1. **Comparative Analysis:** The development level of Uzbekistan's labor market and digital economy was compared with international experiences. This method allowed the study of the application of digital technologies and employment trends domestically and abroad.

2. **Correlation Analysis:** The relationship between workforce qualification levels, the degree of technology implementation, and the number of jobs was investigated. For example, the study analyzed how the level of digital technology adoption varies in regions with a highly qualified workforce.

3. **Probabilistic Regression Model:** Where sufficient statistical data were available, regression analysis was employed to identify the impact of digital technologies on employment. This method helped determine causal relationships between technologies and changes in job numbers.

4. **Interviews and Surveys:** Conversations were conducted with industry experts, researchers, and workforce representatives to collect qualitative data on practical challenges and opportunities in implementing digital technologies. These insights helped understand the real effects of digital transformation.

During the research, the following key indicators were analyzed:

1. **Workforce Qualification Levels:** The readiness of highly skilled workers to adopt digital technologies and adapt to new professions was studied.
2. **Number and Types of Jobs:** The study examined the decrease or increase in job numbers resulting from digital technology implementation, as well as the emergence of new professions.
3. **Degree of Technology Adoption:** The extent and fields of use of technologies such as cloud computing, automation, and artificial intelligence were identified, along with their impact on the workforce.
4. **Regional Differences:** The study analyzed the disparity in the implementation of digital technologies and workforce qualification levels between urban and rural areas. While the adoption of advanced technologies is more widespread in cities, infrastructure and qualification gaps persist in rural regions.[5]

ANALYSIS AND RESULTS:

Job Creation and Loss: The development of digital technologies has led to the automation of certain occupations, resulting in a reduction in some job types. Specifically, roles involving simple data entry, arithmetic calculations, and other repetitive, routine tasks—such as data entry operators, cashiers, and basic administrative assistants—are increasingly being replaced by technology. Cloud computing, artificial intelligence, and automated systems perform these tasks quickly and efficiently, reducing the need for human involvement.

On the other hand, new job opportunities are emerging in the sectors of the digital economy. Significant growth is observed in IT, electronic services (e-government), fintech, e-commerce, digital marketing, data analysis, and cybersecurity. New professions such as software developers, data analysts, technical support specialists, and digital marketing experts are forming in these fields.[6]

Changes in Skill Requirements: The digital economy is driving substantial changes in labor skill demands. Beyond traditional professional skills, the following digital competencies are increasingly required:

The education system is adapting to meet these demands. New curricula are being developed in vocational colleges and higher education institutions, including courses on digital technologies, programming, data analysis, and cybersecurity. Existing programs are being revised to align with contemporary requirements.

Regional Differences: There are significant disparities between urban and rural areas in terms of digital infrastructure and access to opportunities. Cities have seen expanded high-speed internet access and widespread availability of smartphones and computers. Government digital strategies and infrastructure development projects have yielded positive results in urban centers.

Conversely, rural areas experience lower internet penetration and less access to digital devices among the population. This limits digital literacy and opportunities to enter new types of jobs in these regions. Expanding internet infrastructure and digital services in rural areas remains a priority.[7]

Social and Political Factors: Government policies promoting the digital economy play a crucial role in preserving existing jobs and creating new ones. Tax incentives, grants, international cooperation projects, support for startups, and investments encourage the adoption of digital technologies.

However, digital illiteracy and the "digital divide" among different social groups remain significant challenges. Differences in digital access persist between youth and older generations, as well as between urban and rural populations. This creates social inequality and barriers to the effective use of digital technologies. Hence, state and civil society organizations need to strengthen digital literacy programs and introduce the population to modern technologies.[8]

Conclusion: The study's findings indicate that digital technologies are bringing profound changes to Uzbekistan's labor market. Automation and artificial intelligence reduce the number of simple, repetitive jobs, while new technologies create jobs in digital services, IT, fintech, and e-commerce sectors.

There are notable shifts in skill requirements, with digital literacy, programming, data analysis, and technical support becoming essential skills. Therefore, the education system must be reorganized based on modern demands, and new curricula introduced in vocational and higher education institutions.

Regional disparities are significant; although digital infrastructure and opportunities have improved in cities, rural areas still lag behind. Specialized programs are necessary to bridge digital illiteracy and ensure equitable access to technology across all regions.

Furthermore, government policies—including tax incentives, grants, international cooperation, and investments—play a key role in fostering the digital economy. To reduce social and cultural divides, comprehensive digital literacy initiatives and measures to enhance technology accessibility are crucial.

Overall, while digital technologies expand opportunities in the labor market, their success depends on comprehensive efforts in upskilling, education system reform, and ensuring social equity.

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