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Providing Labor Opportunities in Uzbekistan's ICT Sector for the Digital Economy

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Abstract: This study examines job growth trends in the Republic of Uzbekistan's ICT sector, as well as geographical disparities and sector-related factors. The study used statistical data to examine the change in the number of employees working in the ICT sector between 2020 and 2023, as well as identify regional disparities. The findings indicate that, despite the sector's overall positive expansion, employment in the ICT sector has decreased in several regions. The study also looked at the impact of ICT infrastructure, school quality, and state policy on the labor market. International experience was also reviewed, and viable measures for developing the ICT sector in Uzbekistan were proposed.

Key words: information and communication technologies, labor market, employment, economic development, ICT infrastructure, regional disparities, digital economy, innovations, state policy, strategic development.

Introduction

Employment and labor market in the ICT sector in Uzbekistan Within the framework of the Strategy of the President of the Republic of Uzbekistan "Digital Uzbekistan - 2030" No. PF-6079 dated October 5, 2020, a number of measures have been established to develop the ICT sector and expand jobs in the sector[1]. Based on this strategy, the development of IT parks, startups, and innovative ecosystems is being encouraged, which leads to an increase in demand for ICT specialists in the labor market.

Digital technologies are developing at an important professional level in the modern economy. The main part of the economic transformation is the need to attract and retain new workers, who are already in the process of economic development[2]. The most promising trends are: the emergence of artificial intelligence, automation and digital services, which has led to a demand for new professions that have replaced traditional professional positions. This has reduced the

[1] Dasgupta, S. and A. Singh. 2006. "Manufacturing, Services and Premature Deindustrialization in Developing Countries: A Caldorian Analysis."

[2] Hendrickx, Frank. 2019. "Privacy 4.0 at Work: Regulating Employment, Technology and Automation Automation, Artificial Intelligence, & Labor Law.

demand for new professions that occupy the same place as traditional professions, and the unemployment rate has changed dramatically. New professions are also emerging due to new technologies, so that the labor market is ready to accept specialists in digital transformation.

In the history of the Republic of Uzbekistan, the economic boundaries of the digital sphere have been resonating with the countries of the world in the process of mutual integration. The consequences of digital transformation, whether they are widespread in climatic conditions or the actions of services, create significant problems for businesses. Among the digital elites, on the one hand, traditional professions are emerging due to the lack of work and the increase in their level for new ones, on the other hand, the conditions are reduced to creating a problem of unemployment in the circle of conditions. If specialization is established in these conditions, it is reasonable to argue against the need to formulate a state policy on creating new jobs and improving the digital skills of the workforce.

This article analyzes the emergence, requirements and results of unemployment in the conditions of the digital economy. Within the framework of such current issues, international experience and research and national-level strategies for preventing digital unemployment in Uzbekistan are presented.

Literature Review

Scientific studies on employment, the digital economy, and regional differences in the ICT sector show that the development of the digital economy has a significant impact on the structure of the labor market. In this regard, this section reviews studies, legislative documents, and scientific and analytical sources in the field conducted in Uzbekistan and internationally.

The development of the digital economy is causing changes in the structure of the labor market in global economic processes. In particular, Dasgupta and Singh state in their studies “In their studies, they emphasize that digital technologies can increase automation in the labor market and lead to a reduction in traditional jobs.” At the same time, the emergence of new professions and jobs in the digital economy helps to prevent employment problems. Hendrickx, Frank’s study noted that digital transformation serves to increase the flexibility of the labor market. “According to him, the development of the ICT sector will increase the opportunities for remote and freelance work for workers, as a result of which the employment level may be stable.” In the context of the Uzbek economy, studies on the development of the ICT sector also show that the widespread introduction of digital technologies will allow the creation of new forms of employment. However, in this process, it is necessary to expand the ICT infrastructure and train qualified personnel to reduce regional disparities.

Regional disparities in the ICT sector are associated with the level of development, the state of infrastructure and the shortage of qualified personnel. International studies show that. In order for the development of the digital economy to have a positive impact on the territorial balance of employment, it is necessary to develop local infrastructure. Although in the conditions of Uzbekistan this process is taking place intensively in the city of Tashkent and some developed regions, employment in the ICT sector is developing slowly in some regions.

In conclusion, the literature review shows that the digital economy and the ICT sector are becoming an important component of the labor market. In the context of Uzbekistan, although employment in the ICT sector is growing, there are regional disparities. To develop the ICT labor market, it is necessary to improve the ICT infrastructure, train qualified personnel, and use international experience. In the future, it is important to further improve state policies to increase employment in the ICT sector and reduce regional disparities, introduce innovative approaches to the sector, and strengthen local and international cooperation.

Research methodology

In the process of conducting this study, the methods of systematic analysis of scientific knowledge, monographic observation, statistical abstraction, logical analysis and prospective forecasting were widely used. Also, the methods of analysis and synthesis were effectively used during the scientific research.

Analysis and discussion of results

This table reflects the changes in employment in the ICT sector over time. It analyzes the growth rates of the number of employees, the dynamics by region and the development trends of the ICT sector. While a significant increase in the number of employees was observed in some regions, there is a tendency to decrease in some regions. These changes are presented in Table 1.

Table: ICT Sector Employment in Uzbekistan by Region (2020–2023)

Region	Year	Number of Employees
Republic of Karakalpakstan	2020	1302
Republic of Karakalpakstan	2021	1222
Republic of Karakalpakstan	2022	1124
Republic of Karakalpakstan	2023	1394
Andijan region	2020	1702
Andijan region	2021	1441
Andijan region	2022	1708
Andijan region	2023	1582
Bukhara region	2020	1770
Bukhara region	2021	1801
Bukhara region	2022	1979
Bukhara region	2023	1826
Jizzakh region	2020	1113
Jizzakh region	2021	832
Jizzakh region	2022	597
Jizzakh region	2023	672
Kashkadarya region	2020	1052
Kashkadarya region	2021	1243
Kashkadarya region	2022	1248
Kashkadarya region	2023	1407
Navoi region	2020	1328
Navoi region	2021	1247
Navoi region	2022	1040
Navoi region	2023	1031
Namangan region	2020	1491
Namangan region	2021	1538
Namangan region	2022	1511
Namangan region	2023	1458
Samarkand region	2020	1871
Samarkand region	2021	1973
Samarkand region	2022	1973
Samarkand region	2023	2538
Surkhandarya region	2020	1031
Surkhandarya region	2021	1007
Surkhandarya region	2022	1073

Surkhandarya region	2023	1067
Syrdarya region	2020	776
Syrdarya region	2021	666
Syrdarya region	2022	718
Syrdarya region	2023	934
Tashkent region	2020	2713
Tashkent region	2021	2727
Tashkent region	2022	2793
Tashkent region	2023	3048
Fergana region	2020	2661
Fergana region	2021	2212
Fergana region	2022	2430
Fergana region	2023	2605
Khorezm region	2020	1205
Khorezm region	2021	1186
Khorezm region	2022	1304
Khorezm region	2023	1469
Tashkent city	2020	30142
Tashkent city	2021	34687
Tashkent city	2022	40964
Tashkent city	2023	50596
Republic of Uzbekistan	2020	50157
Republic of Uzbekistan	2021	53782
Republic of Uzbekistan	2022	60462
Republic of Uzbekistan	2023	71627

Source: “This information is compiled on the basis of the official website of the Main Department of Statistics under the President of the Republic of Uzbekistan. https://www.stat.uz”[3]

Year-by-Year Employment Dynamics in the ICT Sector Across Uzbekistan's Regions (2020–2023). This table illustrates the annual number of employees working in legal entities within the ICT sector across various regions of Uzbekistan. The data, spanning from 2020 to 2023, provides insight into the evolving structure of the digital labor market in each region. Notably, Tashkent city consistently recorded the highest figures, growing from 30,142 in 2020 to 50,596 in 2023, highlighting its dominance in the national ICT ecosystem. Samarkand and Kashkadarya regions also exhibited considerable growth, reflecting the expanding digital infrastructure and investment in those areas. Conversely, regions such as Jizzakh and Navoi experienced declines, particularly in 2021 and 2022, indicating regional imbalances in ICT development and workforce training. These trends underscore the necessity for equitable investment in ICT infrastructure, digital education, and job creation across all regions to ensure inclusive growth within Uzbekistan's digital economy.

The following factors influenced the change in employment in the ICT sector by region: Digital economy and state programs: Programs to support the ICT sector adopted by the government, including the “Digital Uzbekistan - 2030” strategy, increased demand for the sector. IT parks and startup ecosystem: The active development of IT parks in Tashkent city, Samarkand and Tashkent regions has led to an increase in jobs.

Regional differences: In some regions, employment has decreased due to the slow development of the ICT sector, lack of infrastructure and a shortage of qualified personnel. Post-pandemic

[3] https://www.stat.uz”

changes: The development of remote work formats after 2020 may have led to a decrease in employment in the ICT sector in some regions.

Conclusions and recommendations

The increase in employment in the ICT sector clearly reflects Uzbekistan's aspiration for a digital economy. Although jobs in this sector increased significantly during 2020–2023, there are regional disparities. Therefore, in the future, one of the main priorities should be the equal development of ICT infrastructure across regions, strengthening the system of training qualified personnel, and creating a favorable investment climate for IT companies.

In the context of a digital economy, it is necessary to implement the recommended strategies to ensure the sustainable development of the ICT sector, create new jobs, and reduce disparities between regions. This will not only serve to develop the digital sector of the Uzbekistani economy, but also to strengthen the country's position in the global digital market.

Development of regional ICT infrastructure: Creation of IT parks, technoparks, and innovation centers in Jizzakh, Navoi, Andijan, and Fergana regions, where the development of the ICT sector is slow. Increase the level of provision of fiber-optic communication and high-speed Internet to improve the quality of the Internet and the availability of digital services.

Strengthen the system for training qualified ICT personnel: Expand specialized educational programs in the ICT sector in schools and higher education institutions. Introduce programs for training specialists with international certificates in the IT sector in the regions. Develop specialties necessary for the digital economy, in particular, expand courses in software development, artificial intelligence, cyber security and data engineering.

Increase employment and create jobs in the ICT sector: Create new jobs in the regions by introducing tax incentives and subsidies for local IT companies and international technology companies. Support startups operating in the ICT sector, establish digital incubators and accelerators. Expand preferential loans and subsidy programs aimed at developing entrepreneurship in the ICT sector.

Strengthening public-private sector cooperation: Establishing regional IT training centers and startup incubators in collaboration with large ICT companies. Expanding international cooperation to introduce advanced technologies in the ICT sector, including implementing joint projects with foreign IT companies and universities. Creating a favorable environment for attracting investments in the ICT sector, in particular, establishing special economic zones for foreign IT companies.

Reducing territorial disparities and implementing an inclusive ICT strategy: Launching special programs for ICT specialists in regions lagging behind in development in the digital economy. Establishing free training courses and law programs in digital technologies to increase interest in the ICT sector among women and young people. Implementing mass IT education programs to improve the digital skills of the adult population.

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