

THE TRANSFORMATION OF THE LABOR MARKET IN THE CONTEXT OF THE DIGITAL ECONOMY: THE ROLE OF DIGITAL SKILLS

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Abstract: The digital economy is changing the structure of the labor market, the content of occupations, the logic of employment relations, and the requirements imposed on human capital. This article examines the transformation of the labor market under the influence of digitalization and analyzes the role of **digital skills** as a key condition for employability, productivity, and professional competitiveness. The study explains the essence of digital labor market transformation, its structural elements, formation factors, practical applications, existing problems, and development directions. The research is based on qualitative analysis of scientific literature, international reports, policy documents, and empirical indicators related to Uzbekistan's digital economy. The findings show that digital skills are no longer limited to the information technology sector. They have become necessary for economists, teachers, accountants, managers, entrepreneurs, public servants, and service-sector workers. In Uzbekistan, the information and communication sector employed 87,800 people in 2023, compared with 62,200 in 2020, while more than 10,000 IT-related vacancies were posted on the national job platform HH.uz in 2023. These indicators show that digital skills are becoming a real labor market requirement rather than an abstract educational goal. At the same time, the digital economy creates new risks, including skills mismatch, regional inequality, insufficient digital literacy, weak forecasting of labor demand, and exclusion of workers who cannot adapt to new technologies. The article argues that the development of digital skills should be treated as a strategic component of economic modernization, not as a narrow technical issue. Effective labor market adaptation requires stronger cooperation between universities, employers, government institutions, and private training providers.

Keywords: digital economy, labor market, digital skills, human capital, employment transformation, digital literacy, automation, skills mismatch, Uzbekistan.

Introduction

The labor market is one of the economic systems most directly affected by digital transformation. In the industrial economy, the main value of labor was usually connected with physical effort, professional specialization, and stable workplace routines. In the digital economy, the value of labor increasingly depends on the ability to work with information, digital platforms, automated systems, data flows, artificial intelligence tools, and online communication environments. This change does not only affect programmers or engineers. It changes the work of economists who analyze digital financial data, teachers who use learning management systems, accountants who operate cloud-based software, entrepreneurs who sell through electronic platforms, and public servants who deliver digital services.

The concept of the **digital economy** refers to an economic system in which digital technologies become a decisive factor in production, exchange, management, communication, and service delivery. Its content includes electronic commerce, digital public services, online banking, platform employment, artificial intelligence, data analytics, cloud technologies, cybersecurity, and digital entrepreneurship. The labor market in this context becomes more flexible, more competitive, and more dependent on continuous learning. Jobs are not disappearing in a simple mechanical way. Their internal structure is changing. Routine operations are automated, while analytical, technological, communicative, and creative tasks gain greater value.

The relevance of this issue is especially visible in Uzbekistan. The national strategy “Digital Uzbekistan-2030” was approved in 2020 and defines digital infrastructure, digital economy, e-government, the national IT sector, and IT education as priority areas of development. The OECD notes that this strategy aims to expand digital technologies across the economy, public administration, education, healthcare, agriculture, and infrastructure. The legal and strategic basis for digital transformation has therefore already been formed, but the quality of labor market adaptation depends on whether the population and workforce acquire practical digital competence.

The global context confirms the same trend. The World Economic Forum’s Future of Jobs Report 2025 is based on the views of more than 1,000 employers representing over 14 million workers in 55 economies and shows that technological change will remain one of the strongest drivers of job and skill transformation up to 2030. Employers expect

39 percent of key skills required in the labor market to change by 2030, which means that education systems and professional training models cannot remain static.

Literature review and methodology

Scientific literature on the digital transformation of the labor market develops around several connected ideas. Uzbek and international researchers emphasize that digitalization creates new employment opportunities, increases productivity, expands remote work, and supports entrepreneurship. At the same time, they also point to risks such as skills mismatch, digital inequality, unstable platform employment, and insufficient institutional coordination.

Amanov analyzes the role of digitalization in increasing employment and emphasizes that the digital economy affects labor market organization, flexible forms of work, digital enterprises, and employment models. His approach is important because it links digital transformation not only with technology, but also with the employment structure and business organization. Bobokulov studies the development directions of the digital economy in Uzbekistan and highlights the importance of the “Digital Uzbekistan-2030” strategy, digital infrastructure, e-government, digital education, innovation policy, and human capital. His research shows that digital transformation improves public services and competitiveness but also requires stronger digital literacy and more balanced regional access.

Musev, Bekov, and Bandov analyze digital skills and virtual work in the context of Uzbekistan’s labor migration. Their study is valuable because it shows that digital skills can transform not only domestic employment, but also cross-border work opportunities. They argue that virtual labor markets allow Uzbek workers to participate in international employment without physical migration, but this requires targeted digital skills, recognition of qualifications, and alignment of training with global standards.

The methodology of this article is based on qualitative document analysis, comparative interpretation, and analytical synthesis. The research uses scientific articles by Uzbek researchers, policy documents, international reports, and available statistical indicators on Uzbekistan’s digital economy. The analysis focuses on the essence of labor market transformation, the structure of digital skills, practical areas of application, problems of implementation, and development directions. The article does not use a survey or econometric model. This choice is appropriate because the purpose is to explain



the conceptual and practical significance of digital skills in the digital economy rather than to calculate a narrow statistical correlation.

Analysis and results

The transformation of the labor market in the digital economy can be understood through the changing relationship between technology, skills, employment, and productivity. The traditional labor market relied mainly on formal qualifications, fixed workplaces, and stable professional boundaries. The digital labor market increasingly rewards workers who can combine professional knowledge with **digital literacy, data competence, online collaboration, cybersecurity awareness, and adaptive learning.**

Digital skills have several structural levels. Basic digital skills include the ability to use computers, mobile devices, office programs, email, search systems, electronic documents, and online platforms. Intermediate digital skills include digital content creation, electronic commerce, cloud collaboration, online marketing, data visualization, and the use of professional software. Advanced digital skills include programming, database management, artificial intelligence, machine learning, cybersecurity, software engineering, and data science. Complementary skills include analytical thinking, communication, creativity, ethical responsibility, adaptability, and the ability to learn continuously. The strongest workers in the digital economy are not always those who know one software program. They are those who can quickly transfer knowledge from one technological environment to another.

Uzbekistan's labor market already shows signs of this transformation. The UNDP Digital Economy Study reports that employment in Uzbekistan's information and communication sector increased from 62,200 people in 2020 to 87,800 people in 2023. The same study notes that more than 10,000 IT-related vacancies were posted on HH.uz in 2023, with the highest demand for developers and programmers, computer designers, technical support specialists, IT analysts, project managers, system administrators, testers, and information security experts. These figures show that digital skills have become a measurable factor of labor demand.

The practical application of digital skills is visible in almost every sector. In banking, employees use mobile banking platforms, customer databases, electronic payment systems, anti-fraud technologies, and digital identification tools. In education, teachers prepare electronic resources, manage online courses, assess students through



digital systems, and use interactive platforms. In agriculture, digital tools support satellite monitoring, smart irrigation, electronic logistics, and market price analysis. In public administration, digital skills are required for document circulation, citizen services, electronic databases, and interdepartmental data exchange. In entrepreneurship, digital literacy allows small businesses to sell through marketplaces, use targeted advertising, manage online payments, and communicate with customers through digital channels.

The formation of digital skills depends on several factors. The most important factor is the quality of education. If schools, universities, and vocational institutions teach digital tools only theoretically, graduates remain weak in real professional environments. Digital competence requires practice, project-based learning, industry cases, and tasks connected with actual labor market needs. Infrastructure is another factor. A worker cannot develop strong digital competence without stable internet, modern devices, licensed software, and access to learning platforms. Motivation also matters. Digital learning becomes effective when a person understands that these skills increase income, mobility, and professional stability. Institutional coordination is equally important. If the education system, employers, government agencies, and training centers act separately, the result will be fragmented and inefficient.

The analysis identifies several serious problems. The most visible problem is **skills mismatch**. Many graduates possess diplomas but lack the practical digital skills required by employers. This mismatch is dangerous because it creates unemployment among educated youth and labor shortages among firms at the same time. Another problem is **regional digital inequality**. Urban youth have better access to IT courses, coworking centers, private academies, and employment networks, while rural youth may remain limited by weak infrastructure and fewer training opportunities. Gender inequality is also relevant. The UNDP study notes that women make up less than 11 percent of IT students in Uzbekistan, and gender gaps remain visible in basic, standard, and advanced digital skills.

A further problem is the weak measurement of digital skills. The OECD states that Uzbekistan does not yet have a systematic national-level mechanism for quantitative and qualitative forecasting of digital skills demand. It also notes that limited public-private dialogue reduces the government's ability to identify skills gaps across the labor market and specific industries. This is a structural weakness. A country cannot design effective

digital education policy without knowing which skills are needed, where they are needed, and how fast demand is changing.

Discussion

The role of digital skills should not be reduced to technical training. This would be a weak and incomplete interpretation. Digital skills are part of **human capital**, and human capital determines how effectively society can use technological progress. A country may import software, build platforms, and create digital strategies, but these investments will produce limited results if workers, managers, teachers, entrepreneurs, and public servants cannot use them productively.

The labor market of the digital economy has a clear internal logic. Technology reduces the value of repetitive tasks and increases the value of tasks that require analysis, interpretation, creativity, communication, and responsible decision-making. A cashier who only performs manual payment operations becomes vulnerable to automation. A cashier who can operate digital payment systems, manage customer data, and support online sales becomes more valuable. An accountant who only records transactions mechanically may lose competitiveness. An accountant who can use cloud accounting systems, analyze financial dashboards, detect risks, and explain data to management becomes more relevant. A teacher who only repeats textbook material faces difficulty in a digital learning environment. A teacher who can create digital lessons, manage online assessment, and personalize learning becomes more effective.

The main development direction should therefore be practical and sector-specific digital education. Economics students should learn spreadsheet modeling, business analytics, digital accounting platforms, e-commerce analysis, and data-based decision-making. Pedagogy students should learn educational technologies, digital assessment, multimedia content creation, and responsible use of artificial intelligence. Agriculture students should learn digital mapping, smart monitoring, and digital market systems. Medical students should learn electronic health records, telemedicine tools, and data privacy principles. This approach is stronger than teaching one general computer literacy course to all students without professional context.

Universities also need stronger cooperation with employers. Curricula should be updated through labor market evidence, not through formal revision alone. Employers should participate in curriculum design, internship organization, project evaluation, and



certification systems. Short-term micro-credentials can also support employability. A student who studies economics but additionally receives certificates in data analytics, digital marketing, or business intelligence becomes more competitive than a graduate who relies only on a diploma.

Government policy should focus on inclusive access. Digital skills development should not be concentrated only in Tashkent or large cities. Regional IT centers, affordable online courses, mentorship networks, public-private training partnerships, and targeted programs for women and rural youth are necessary.

The UNDP study reports that specialized IT centers have been established across Uzbekistan and that digital education initiatives such as “One Million Uzbek Coders” reached significant participation. These initiatives are valuable, but their effectiveness depends on quality control, labor market alignment, and real employment outcomes.

The private sector also has responsibility. Many firms complain about the shortage of digital skills but do not invest enough in staff training. This creates a contradiction. Digital transformation cannot happen only through hiring new specialists. Existing workers must be reskilled. Small and medium-sized enterprises need simple, affordable, and practical digital training that directly improves productivity. For example, a small manufacturing firm may not need advanced artificial intelligence at the initial stage, but it may need digital inventory management, electronic accounting, customer relationship management, and online sales tools. The correct policy is not to force every business into complex technologies, but to help each business adopt digital tools that match its scale, resources, and market position.

Conclusion

The transformation of the labor market in the context of the digital economy is a deep structural process that changes employment relations, skill requirements, career trajectories, and the meaning of professional competitiveness. Digital skills have become a necessary component of modern human capital. They influence not only access to IT jobs, but also productivity in education, finance, public administration, agriculture, entrepreneurship, healthcare, and services.

The Uzbek experience shows both progress and unresolved challenges. The growth of employment in the information and communication sector, the expansion of IT vacancies, and the adoption of the “Digital Uzbekistan-2030” strategy demonstrate that

digital transformation is becoming a real economic process. At the same time, skills mismatch, weak forecasting, regional inequality, gender gaps, and insufficient firm-level digital adoption reduce the speed and quality of this transformation.

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