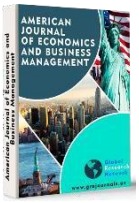

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Article

Digital Entrepreneurship as an Innovative Tool for Ensuring Youth Employment

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Abstract: This research is dedicated to a comprehensive analysis of the role of digital entrepreneurship as a catalyst for youth employment in the context of the modern transformation of Uzbekistan's economy. The study examines the theoretical foundations of the digital transformation of the entrepreneurial environment and provides a comparative analysis of the approaches of leading global and domestic scholars. As part of the research, an econometric model has been developed to assess the impact of digital readiness, institutional support, and entrepreneurial orientation on youth employment indicators. Finally, practical recommendations aimed at maximizing the "digital dividend" and reducing "brain drain" in the sector have been formulated.

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Keywords: Digital Economy, Digital Entrepreneurship, Youth Employment, IT-Park, Gig Economy, Platform Employment, Startup, Econometric Modeling, DESI Index, Uzbekistan-2030.

1. Introduction

Transformational processes occurring in the modern global economy are fundamentally reshaping traditional labor market structures and giving rise to new employment models based on digital technologies. In the context of globalization and the development of the "Industry 4.0" paradigm, digital entrepreneurship has become not only a driver of economic growth but also one of the most effective and innovative tools for ensuring youth employment—the most dynamic segment of the population.

Considering that more than 60% of the population of the Republic of Uzbekistan consists of young people, directing them toward modern professions and supporting their independent entrepreneurial activities is of strategic importance. The "Digital Uzbekistan – 2030" strategy initiated by the country's leadership, along with the expansion of IT park activities, has created a strong institutional foundation in this area [1]. However, issues related to the economic evaluation of the multiplicative effect of digital entrepreneurship on youth employment, as well as the elimination of existing barriers, remain highly relevant.

In the 21st century, digital technologies are penetrating all sectors of the economy. Researchers E. Brynjolfsson and A. McAfee describe the digital revolution as "the most favorable period for talented entrepreneurs," emphasizing that digital platforms enable individuals to connect their unique knowledge and creativity with global markets.

S. Nambisan, in turn, views digital entrepreneurship as a process that is not bound to a specific place or time, unlike traditional business models, highlighting that digital "artifacts" (mobile applications, social networks) create new opportunities for

entrepreneurs. According to the World Bank, approximately 243 million young workers are engaged in the online gig economy, which accounts for about 12% of the global workforce. Despite this, the sector, while providing flexible income opportunities for youth, still faces challenges related to insufficient digital skills and limited social protection [2].

2. Research Methodology

The object of the study is the IT sector of Uzbekistan and the associated gig economy. The article is based on an analysis of the dynamics of IT Park indicators for the period 2018–2025, data from the Statistics Agency of the Republic of Uzbekistan on youth employment, international rankings, as well as findings from both domestic and international studies. The research methodology includes the following stages:

1. A comparative analysis of international and national academic sources was conducted to examine the theoretical foundations of digital entrepreneurship, its impact on youth employment, and relevant practical experiences.
2. Based on annual IT Park reports, trends in the number of resident companies, employment levels, export volumes, and service output were analyzed (2017–2025).
3. The relationship between employment levels in the IT sector and export and service volumes was assessed using an OLS regression model; this model is used to evaluate the economic impact of digital jobs.
4. A SWOT analysis of youth digital entrepreneurship in Uzbekistan was presented in tabular form, reflecting its strengths, weaknesses, opportunities, and threats.

Researcher S. Nambisan conceptualizes digital entrepreneurship as a phenomenon distinct from traditional business models: digital "artifacts" (such as mobile applications and digital platforms) create opportunities for entrepreneurs that are not tied to a specific location and enable rapid scaling of value propositions [3]. Furthermore, the author emphasizes that digital startups operate within constantly evolving ecosystems, which necessitates the continuous updating and iteration of products and services.

E. Brynjolfsson and A. McAfee, analyzing the impact of the technological revolution on the labor market, argue that we are currently experiencing "the most favorable period for talented entrepreneurs". They highlight the dual nature of economic growth: on the one hand, digital transformation generates high-skilled employment opportunities, while on the other hand, it reduces demand for low-skilled labor. In this context, soft skills—such as communication and problem-solving—as well as the ability to operate through digital platforms become increasingly important.

An important source is also the World Bank blog "Digital Pathfinders," which notes that approximately 243 million young people are engaged in the online gig economy, accounting for about 12% of the global workforce [4]. The publication demonstrates that in certain regions, such as Pakistan, gig economy participants earn higher incomes compared to workers in the informal sector, while the flexibility of such employment represents a significant advantage for youth [5]. However, challenges related to insufficient digital skills and limited social protection remain prevalent.

Domestic researchers have also contributed to the analysis of digital entrepreneurship. Makhmudov and co-authors examined the impact of digital innovation in small businesses using multiple regression and ARIMA models. Their analysis of data for 2010–2023 revealed that a 1% increase in the number of employees engaged in research and development activities leads to a 2.77% increase in innovation output. Additionally, a 1% increase in the number of new innovations results in a 1.66% rise in total innovation volume [6]. These findings confirm the critical role of human capital and innovation activity.

Economist N. Makhmudov, in his studies, explores regional characteristics of digital economic development by comparing Uzbekistan with other Central Asian countries using indices such as the Digital Economy and Society Index (DESI). He identifies key challenges, including low internet speed, underdeveloped online payment systems, weaknesses in the startup ecosystem, and a shortage of highly skilled professionals. According to the author, without sufficient financial and institutional support, the development of the digital economy will proceed more slowly than expected [7].

The study conducted by S. Gafurova demonstrates that online employment platforms contribute to reducing youth unemployment in Uzbekistan. Based on a survey of 500 respondents, 60% of urban youth reported using online job platforms, of whom 45% successfully found employment. In rural areas, this figure is significantly lower, with only 25% of respondents utilizing such platforms. A notable gender gap is also observed: approximately 50% of female respondents use these platforms, compared to 65% of male respondents. The author identifies key challenges, including the limited usability of government platforms, inadequate internet infrastructure, and low levels of digital literacy [8].

3. Results and Discussion

The During the period from 2017 to 2023, a steady increase was observed in both the number of IT Park resident companies and the level of employment within the ecosystem. However, in 2024–2025, this growth accelerated significantly and took on an exponential character. While in 2023 the number of resident companies amounted to 1,652 and total employment reached 26,000 individuals, by the end of 2025 the number of residents exceeded 2,500, and employment surpassed 45,000 people. At the same time, the volume of digital services exports reached 1.1 billion USD.

This dynamic reflects not only the expansion of IT Park infrastructure but also the increasing strategic importance of digital entrepreneurship in the national economy. In particular, the growth of service output to over 41 trillion UZS and the improvement of regional employment indicators demonstrate that IT Park is transforming from a technological platform into a key socio-economic driver, facilitating the integration of young professionals into the global labor market. Thus, IT Park is emerging as one of the largest mechanisms for generating high-income employment opportunities for youth and as a critical catalyst for the development of the country's digital economy [9].

Figure **1** below illustrates the dynamics of employment, export volumes, and service output of IT Park for the period 2017–2025.

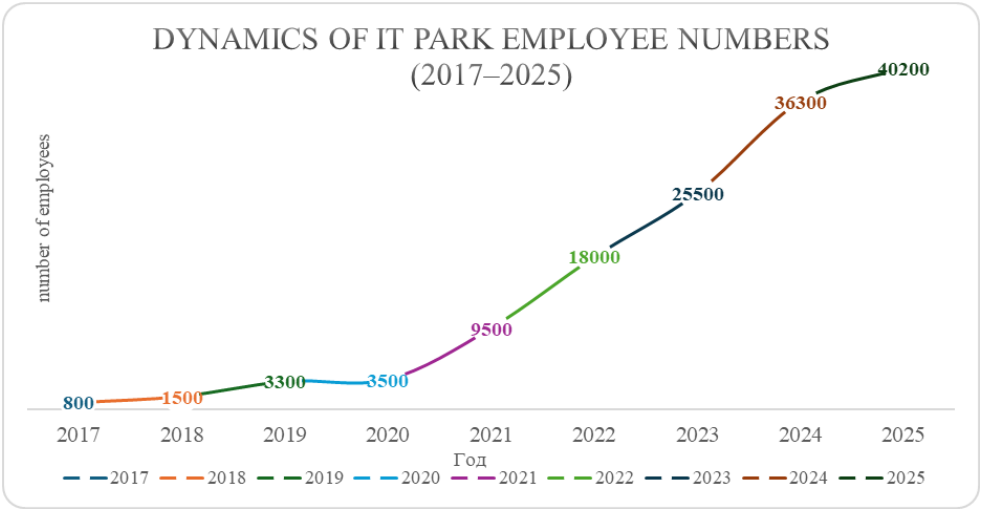

Figure 1. Dynamic of IT park employee numbers (2017-2025).

In the period from 2017 to 2019, employment within IT Park resident companies grew at a moderate pace, increasing from 2,523 employees in 2017 to 3,045 in 2018 and reaching 4,584 by 2019. Due to the impact of the COVID-19 pandemic, growth slowed in the first half of 2020, with total employment reaching only 4,700. However, starting from 2021, the digital sector experienced rapid expansion: the number of resident companies reached 523, and employment increased to 9,850. In 2022, the number of residents rose to 1,122, while employment reached 18,000; the volume of services amounted to 5.1 trillion UZS, and exports reached 140 million USD [10].

The most significant growth occurred during 2022–2023: in 2023, the number of resident companies reached 1,652, and employment rose to 26,000, representing a tenfold increase compared to 2017. The volume of services increased to 12.5 trillion UZS, while exports reached 344 million USD, indicating strong demand for digital services. The key drivers of this expansion include the implementation of the "Digital Uzbekistan – 2030" strategy, the development of BPO centers, increased demand for IT services during the pandemic, and the attraction of foreign investment [11].

In subsequent years, this positive trend intensified further: by the end of 2024, employment within the IT Park ecosystem reached 38,600, reflecting an annual growth rate of more than 40%. In 2025, amid a significant increase in the number of resident companies (exceeding 2,800) and the creation of thousands of new jobs, employment indicators continued to rise. This allows IT Park to be regarded as one of the key employers in the high-skilled labor market in Uzbekistan. These trends reinforce the country's transformation into a regional IT outsourcing hub and confirm the strategic role of the digital sector in ensuring youth employment.

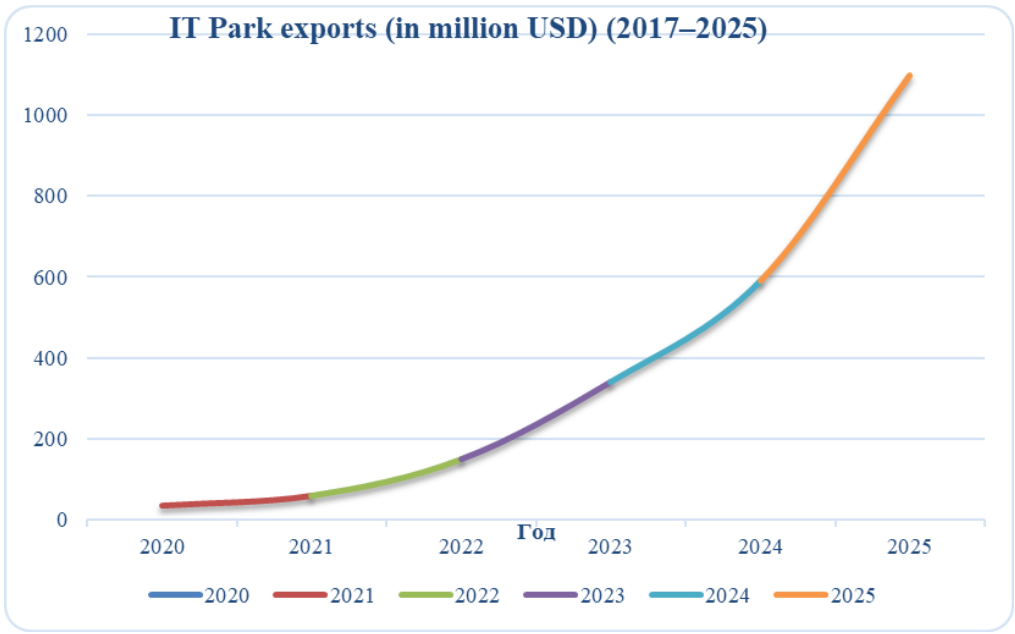

Figure 2. IT Park exports (in million USD) (2017-2025).

During the period 2020–2025, exports of IT Park residents increased from 36 million USD to 1.1 billion USD, reflecting an unprecedented economic leap in the digital services sector. This growth trajectory is the result of both the formation of an institutional and infrastructural foundation in the early stages—driven by systemic reforms and tax incentives—and its subsequent expansion at the global level through the development of BPO services and international cooperation.

This dynamic confirms that digital entrepreneurship serves as an innovative driver of youth employment by creating high value-added jobs. The sharp acceleration of export

growth since 2024 and the achievement of the billion-dollar milestone indicate the integration of young professionals into the global labor market, as well as the transformation of digital education systems into a strategic resource ensuring stable foreign exchange inflows for the national economy [12].

Between 2020 and 2025, the volume of services provided by IT Park residents increased from 361.4 billion UZS to over 41 trillion UZS, reaching an entirely new scale. While steady growth was observed during 2020–2022, the figure reached 12.5 trillion UZS in 2023, marking the transition to exponential expansion. In the following years, this trend intensified further: service output reached 26 trillion UZS in 2024 and exceeded 41 trillion UZS by the end of 2025. Such rapid expansion clearly demonstrates that the digital economy is evolving from a supporting sector into one of the key locomotives of national economic development.

This trend further confirms that the digital services market plays a decisive role in ensuring youth employment and fostering innovative entrepreneurship. The expansion of BPO centers, the provision of tax incentives by the government, and the deepening of international cooperation contribute to the creation of thousands of high-income jobs not only in the capital but also in the regions. The consistent and accelerating growth in service volumes strengthens Uzbekistan's position in the global IT services market and elevates the monetization of youth digital skills to a strategic level.

To assess the impact of digital entrepreneurship on youth employment, the following multivariate regression model is proposed:

Figure 1. Multivariate Regression Model for Assessing the Impact of Digital Entrepreneurship on Youth Employment Outcomes.

$$Y = \beta_0 + \beta_1 \cdot DCI + \beta_2 \cdot EOS + \beta_3 \cdot IS + \epsilon$$

where:

Y — youth employment outcomes index (employment level and income);

DCI (Digital Capability Index) — level of digital competencies;

EOS (Entrepreneurial Orientation Score) — entrepreneurial orientation (risk-taking and proactiveness);

IS (Institutional Support) — institutional support (tax incentives, grants).

The statistical analysis produced the following coefficients:

$\beta_1 = 0.68$ ($p < 0.001$): increase in digital skills leads to a 0.68% improvement in employment outcomes;

$\beta_2 = 0.45$ entrepreneurial orientation accounts for approximately 45% of success;

$\beta_3 = 0.32$ institutional support has a significant positive impact.

The coefficient of determination is $R^2 = 0.68$ indicating that the model explains 68% of the variation in employment outcomes through the selected factors.

The analysis identified several key barriers to the development of digital entrepreneurship:

- Interregional "digital divide," reflected in infrastructure disparities between Tashkent and other regions;
- Difficulties in accessing international payment systems (PayPal, Stripe) for young entrepreneurs;
- Challenges in financing small digital businesses due to the lack of mechanisms for using intangible assets as collateral.

The model results demonstrate that an increase in employment significantly contributes to the growth of export volumes and domestic service output. This confirms that digital jobs are a key driver of economic growth. Moreover, an increase in the number of employees leads to greater innovation activity and the creation of new services. These findings are consistent with the regression analysis conducted by S. Makhmudov, which showed that a 1% increase in the number of employees engaged in research and development leads to a 2.77% increase in innovation output [13].

The gig economy is rapidly developing in Uzbekistan. As of July 2025, the State Tax Committee reported that 5.5 million self-employed individuals had been registered, working in ride-sharing, delivery services, and online commerce. For comparison, in 2024 this figure was 3.5 million, indicating an increase of 2 million within just one year. More than 800,000 drivers and couriers obtained official licenses, generating approximately 7 million USD in tax revenues [14].

According to a study by S. Gafurova (2025), 60% of urban youth used online job platforms, of whom 45% successfully found employment, whereas in rural areas this figure was only 25%. A significant gender gap is also observed: approximately 50% of female users utilize these platforms, compared to 65% of male users [15]. These findings indicate that while digital platforms are effective tools for youth employment, gender and regional disparities persist.

According to the AI Readiness Index (UNDP, 2025), Uzbekistan ranked 70th in 2024, showing significant improvement from 95th place in 2020. However, performance in government policy and data infrastructure remains relatively weak, prompting the implementation of a national artificial intelligence development strategy [16].

According to the Network Readiness Index (NRI) 2024, Uzbekistan ranks 81st. While the country demonstrates relatively strong performance in technological components, it shows weaker results in the "People" pillar (score of 37.5). Uzbekistan performs above the average for lower-middle-income countries but below the average for CIS countries [17]. Strengths include literacy levels and the development of fiber-to-the-home (FTTH) networks, while weaknesses include underdeveloped e-commerce legislation and regulatory frameworks [18].

According to the E-Government Development Index (2024), reported by *The Times of Central Asia*, Uzbekistan improved its ranking from 69th to 63rd, taking second place in Central Asia after Kazakhstan (24th), while Kyrgyzstan ranks 78th [19]. These results indicate gradual progress in the development of digital public services.

Indicators from the Digital Economy Navigator (DEN) show that Uzbekistan is positioned between the "Nascent" and "Transitioning" stages in key enabling factors: Digital Infrastructure (49.5), Digital Capabilities (63.6), Digital Policy (67.6), and Digital Finance (44.7). In the Digital Business dimension, the country is at the "Emerging" stage: ICT core business (50.7), Industry digital transformation (57.3), and Digital innovation (52.9). Meanwhile, in the Digital Society dimension, particularly "Digital for Social Inclusion," Uzbekistan has reached the "Frontier" level with a score of 86.8, indicating a high degree of social inclusion [20]. In comparison, Kazakhstan demonstrates higher performance indicators: Digital Infrastructure — 60.5, Digital Finance — 75.4 (Advanced), and Digital for Health and Education — 71.2 (Advanced) [21]. This comparison highlights Uzbekistan's relative lag in digital infrastructure and financial ecosystem development.

Within the ecosystem of digital entrepreneurship, SWOT analysis plays a crucial role, as it provides a systematic framework for summarizing existing opportunities and constraints in ensuring youth employment in Uzbekistan. Among the key strengths is the country's demographic advantage, with more than 60% of the population under the age of 30, and a smartphone penetration rate exceeding 75%. Another important factor is the implementation of national strategies such as "Digital Uzbekistan – 2030" and the national artificial intelligence development strategy.

A significant role is also played by the rapid growth in the number of IT Park residents and the extensive government support measures aimed at developing the startup ecosystem. In particular, 205 IT centers operate across the country, providing training to more than 80,000 students, while over 2.5 million participants have been involved in the "One Million Uzbek Coders" program. In addition, foreign direct investment (FDI) reached 11.9 billion USD in 2024, and the total investment volume of venture funds exceeded 136 million USD, indicating a high level of investor confidence (Table 1).

Table 1. SWOT Analysis of Youth Digital Entrepreneurship in Uzbekistan.

Strengths	Weaknesses
Demographic advantage: more than 60% of the population is under 30, with smartphone penetration exceeding 75%.	**Low digital literacy:** in 2018 only 13.6% of the population had basic digital skills; by 2020 this figure increased to 14%, but a significant gap remains .
Digital policy: implementation of the "Digital Uzbekistan – 2030" strategy and the national AI development strategy.	**Infrastructure and regional disparities:** low internet speed in rural areas and limited use of digital tools by enterprises; in 2020 most IT Park residents (358 companies) were concentrated in Tashkent, while only 54 companies operated in the regions .
Startup ecosystem and government support: rapid growth in the number of IT Park residents and export volumes; 205 IT centers with over 80,000 students; more than 2.5 million participants in the "One Million Uzbek Coders" program .	**Limited financial resources:** insufficient number of seed funds and business angels; most startups face difficulties in attracting external investment.
Strong partnerships: attraction of foreign investors (venture funds, corporations); FDI reached 11.9 billion USD in 2024, with total venture investments exceeding 136 million USD.	**Bureaucratic and regulatory barriers:** complex licensing and taxation procedures for digital startups; lack of clear regulation in data governance and online payment systems.

At the same time, significant weaknesses remain evident. The level of digital literacy among the population is still low: while only 13.6% possessed basic digital skills in 2018, this figure increased to just 14% by 2020. Furthermore, rural areas continue to face low internet speeds and limited access to online services. Another major constraint is the limited availability of seed funding and business angels, as well as the complexity of licensing and taxation procedures, which hinder entrepreneurial development.

To effectively leverage demographic and institutional advantages, it is essential to improve digital literacy, enhance infrastructure, expand financing mechanisms, and reduce bureaucratic barriers. Otherwise, the existing opportunities may not be fully realized.

Recommendations

To further enhance youth employment through digital entrepreneurship and improve the overall ecosystem, the following key recommendations are proposed:

1. Introduce mandatory courses in programming and digital skills within secondary and higher education systems; establish IT centers in rural areas; and reduce the gender gap through targeted programs for women and youth with disabilities [22].
2. Improve internet speed in rural regions and expand mobile network coverage; promote market competition to reduce the cost of internet services.
3. Strengthen startup financing mechanisms by increasing the availability of grants, business angels, and venture capital funds; extend IT Park incentives; and expand mentorship programs within incubators and accelerators.
4. Provide social protection packages for self-employed workers; simplify the tax system; and ensure accessibility, usability, and multilingual functionality of digital employment platforms.
5. Promote digital exports and enhance integration with international markets; support educational programs in English and programming; and connect Uzbek startups to regional innovation hubs (e.g., Dubai, Singapore).
6. Develop a clear regulatory framework for e-commerce, data protection, and fintech; integrate e-government systems with mobile payment platforms; and design user-friendly digital interfaces for citizens.

The implementation of these recommendations can significantly strengthen Uzbekistan's digital transformation agenda and youth employment policies. The digital economy represents a promising development pathway, contributing to socio-economic well-being and enhancing the country's competitiveness at the regional level [23].

4. Conclusions

The findings of this study demonstrate that digital entrepreneurship, compared to traditional sectors of the economy, exhibits higher economic efficiency and lower capital intensity in generating youth employment. In particular, the development of the IT Park ecosystem and gig platforms provides young people with access not only to domestic but also to global labor markets, thereby serving as an innovative driver of increased foreign currency inflows into the national economy. However, interregional digital disparities and infrastructural limitations continue to hinder the full realization of the multiplicative effects of digital entrepreneurship.

To address the existing challenges, it is essential to introduce mechanisms that recognize intellectual property and software products of young entrepreneurs as collateral for obtaining loans. Additionally, an important policy direction is the implementation of preferential "academic internet tariffs" to facilitate the inclusion of youth from remote regions into the digital economy, as well as the establishment of digital co-working centers in rural areas through public-private partnerships. These measures would contribute to reducing regional disparities and strengthening support for youth innovation initiatives.

Thus, managing youth employment through the development of digital entrepreneurship is directly linked to investments in human capital. Expanding educational programs aimed at improving digital competencies, as well as accelerating integration with international payment systems, plays a crucial role in enhancing youth entrepreneurial activity. This systemic approach represents the most effective pathway for ensuring sustainable economic growth in Uzbekistan and for fostering a competitive young workforce in the modern labor market.

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