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“HUMAN CAPITAL AND DIGITAL COMPETENCY: EMPIRICAL ASSESSMENT OF READINESS FOR DIGITAL ECONOMY IN UZBEKISTAN”

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ABSTRACT. *This study aims to empirically assess the level of digital literacy among the population of Uzbekistan, using data from an original sociological survey. The research focuses on identifying key digital skills across different demographic and socio-economic categories, revealing gaps in digital readiness, and evaluating how these competencies correlate with broader aspects of human capital, such as education level, employment status, and access to digital infrastructure.*

KEY WORDS: *digital economy, digital technologies, human capital, digital literacy, sociological survey.*

INTRODUCTION.

In the context of global digital transformation, digital literacy is becoming a key element of human capital, directly affecting employment levels, labor productivity, and society’s ability to adapt to technological change. Proficiency in digital skills is now regarded as essential part of full participation in the economic, educational, and social life.

Uzbekistan, currently undergoing an active phase of digitalization, recognizes the strategic importance of digital literacy as a foundation for the modernization of its national economy. Despite the progress achieved in developing ICT infrastructure and e-governance, the differences in access to digital resources across regions and age group still exist. This underscores the need for an empirical assessment of the population’s digital competencies as a basis for designing targeted programs and strategies aimed at strengthening human capital in the digital age.

METHODS.

As part of the study aimed at assessing the level of digital literacy among the population, a small-scale sociological survey was conducted. The survey involved 100 randomly selected citizens of the Republic of Uzbekistan aged 16 and older. The sociological survey was carried out in an anonymous online format using the Google Forms platform[1]. The sample was quota-based and was structured according to the following criteria: gender, age, and level of education (secondary, higher, and postgraduate education).

In total, the questionnaire included 22 questions of both open-ended and closed-ended types, which allowed for both the systematization of the collected data and the expression of respondents’ personal opinions regarding problematic areas of the digital economy, as perceived by them.

[1] https://forms.gle/FtoWhg8z7n5HyPxF7

For the purpose of summarizing and visualizing the analysis, the questions used in the sociological survey were grouped into five main thematic categories:

- **Basic digital skills.**
- **Skills in using digital services and platforms.**
- **Competencies in digital security.**
- **Internet accessibility.**
- **Public engagement with e-government services.**

RESULTS.

Almost half of the respondents—specifically 49%—belong to the 20–29 age group, which indicates the active involvement of youth in the processes of digital transformation. However, the total share of respondents aged 50 and older amounted to only 11% (see Diagram 1).

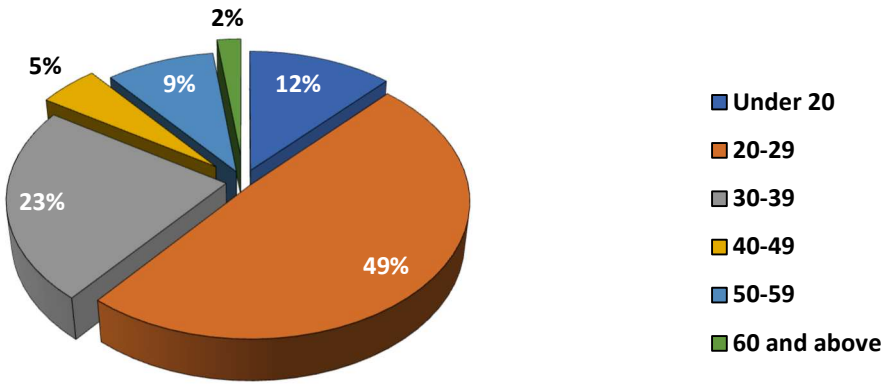

Diagram 1 – Age Categories of Sociological Survey Respondents (in percentages).

It is worth noting that in Uzbekistan, this demographic represents 18.6%[2] of the total population, highlighting the need to improve digital literacy and awareness specifically among individuals aged 50 and above.

To enhance the reliability of the research findings, an extended analysis of the socio-demographic characteristics of the survey participants was conducted (see Table 1). Table 1 provides a detailed breakdown of the respondents' gender, age distribution, and educational background, offering important context for interpreting the survey results.

Table 1 – Socio-Demographic Profile of Respondents.

Indicator	Category	Share (%)
Gender	Men	40%
	Women	60%
Age	Under 20	12%
	20-29	49%
	30-39	23%
	40-49	5%

[2] According to the analysis of open demographic data from the National Committee of the Republic of Uzbekistan on Statistics. Available at: https://stat.uz/ru/ofitsialnaya-statistika/demography (accessed: April 19, 2025).

	50-59	9%
	60 and above	2%
Education level	General secondary	10%
	Secondary (qualifications)	14%
	Basic higher education (BSc)	59%
	Full higher education (MSc)	16%
	Postgraduate	1%

To assess the level of digital literacy, several core dimensions were selected, each reflecting important aspects of digital technology usage:

a) Basic Digital Skills. This dimension describes the capacity to use computers, smartphones, and other digital devices for basic tasks like emailing or being aware of new software programs.

According to the survey, 89% of respondents reported being capable of independently installing new software on their own. These results show that people generally possess a high degree of fundamental digital competency. However, the remaining 11% who lack this skill represent a digitally vulnerable group. Considering the total population of Uzbekistan, this segment equates to approximately 4,129,752 individuals, underscoring the need for inclusive digital education initiatives.

b) Information Search and Internet Navigation. This includes the ability to effectively search for information online—for example, using search engines or working with databases.

The capacity to use GPS-based services like Yandex Maps and Google Maps was evaluated by one of the questions. Only 67% of participants had experience interacting with artificial intelligence tools (such as virtual assistants), despite 90% of respondents confirming proficiency in using such tools. This suggests that although internet usage is high overall, more sophisticated digital interactions are still limited for a sizable portion of the population.

c) Virtual Communication and Social Media Use. This dimension measures the ability to communicate via digital platforms, such as active engagement on social media.

The survey revealed that **95% of respondents** are active users of social networks, while only 5% reported not using such platforms regularly. This suggests that digital communication channels are becoming almost ubiquitous in everyday life.

d) Use of Digital Services and Platforms. This includes the ability to use digital platforms for solving everyday problems, such as making payments via electronic systems or submitting online applications for public services.

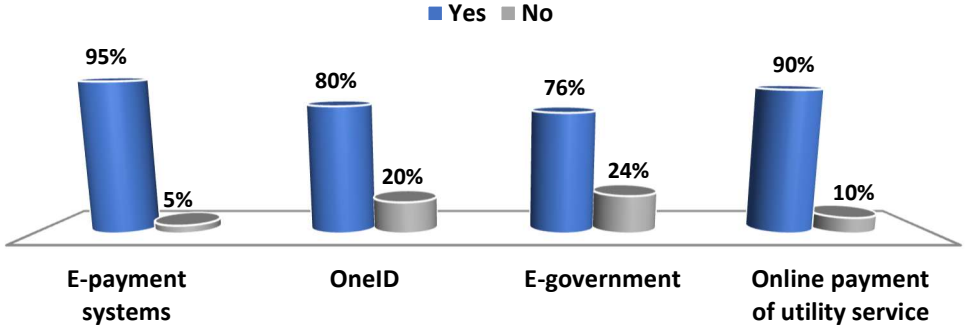

Diagram 2 – Skills in Using Digital Services and Platforms (in percentages).

To reveal the level of user engagement with key digital platforms, the survey measured respondents’ interaction with various digital services (see diagram 2).

The study revealed that the largest proportion of respondents (**95%**) actively use e-payment systems (Click, Payme, Uzum Bank, Visa, MasterCard, etc.). A similar level of engagement (**90%**) was recorded for the online payment of utility services.

Registration in the unified digital identification system OneID was reported by **80%** of respondents, indicating a high degree of familiarity with digital authentication tools. In contrast, **76%** of respondents reported using e-government services, which suggests that certain barriers still remain.

It was also revealed that the less common element of everyday digital service use is the smart home system. Surprisingly, the overwhelming majority of respondents (**91%**) do not use smart home technologies, while only **9%** confirmed having such systems installed. This indicates a very low level of penetration of smart home technologies in everyday life.

It is important to note that smart home systems represent a more **advanced level of digitalization**, which doesn’t only require basic digital skills but also an understanding of IoT (Internet of Things).

The results shown in Diagram 2 reflect an already well-established practice of integrating digital solutions into daily life and point to a growing level of **digital maturity** among citizens. The overall engagement level can be described as consistently high, driven by both the accessibility of digital infrastructure and a developing culture of digital competence in everyday operations.

Diagram 3 presents the results of a survey question assessing users’ awareness of website security when entering bank card details. According to the data, **58%** of respondents indicated that they are able to verify the security of a website before submitting sensitive information, while **42%** reported that they do not perform such checks. This reveals a significant portion of the population potentially vulnerable to cyber threats such as phishing and fraudulent websites, underscoring the need for increased digital safety education and awareness initiatives.

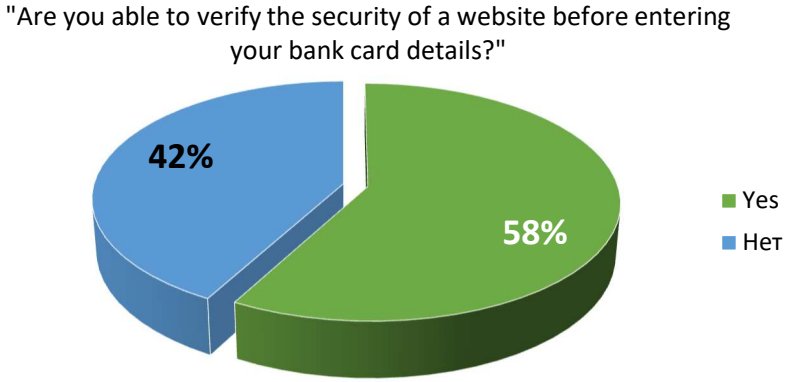

Diagram 3 – User Awareness of Website Security When Entering Payment Data (%).

Additionally, 29% of respondents (48% of whom are young people under the age of 30) do not use two-factor authentication to protect their personal data, whether in messengers or payment systems. This group of users is potentially vulnerable to account breaches, which may indicate a lack of knowledge about possible threats.

Thus, the results of the conducted sociological survey help form a comprehensive portrait of the digital literacy level of Uzbekistan's population (see Diagram 4).

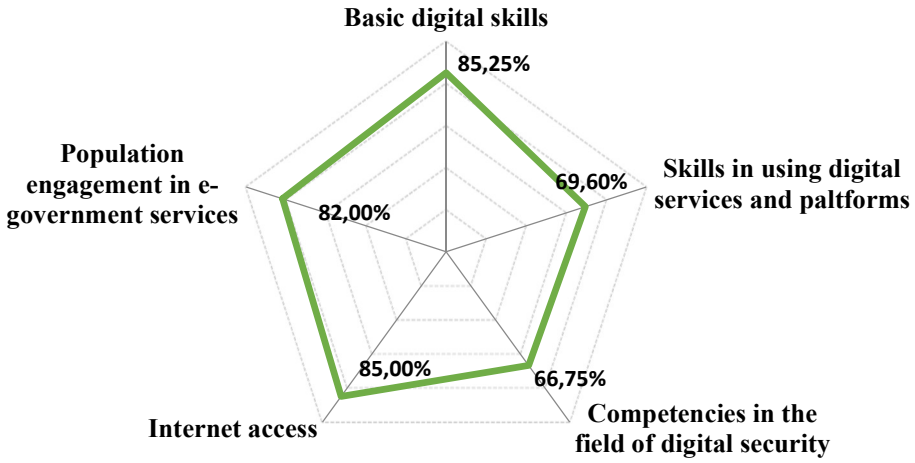

Diagram 4 – Digital Literacy of the Population of the Republic of Uzbekistan (in %).

The diagram shows that the highest level of digital competencies refers to basic digital skills (85.25%), whereas the lowest level is pointed by the digital security competencies (66.75%). While the overall rate of digital literacy of Uzbekistan population remains stable in the point of 77,72%.

The last part of the questionnaire was conducted to reveal respondents’ opinion about the most digitally undergoing economic sectors. The overwhelming majority of respondents identified **education (67%)** and **healthcare (64%)** as the sectors most lacking in digital technology development (see diagram 5). This likely reflects high public expectations for these sectors, as well as their central role in everyday life.

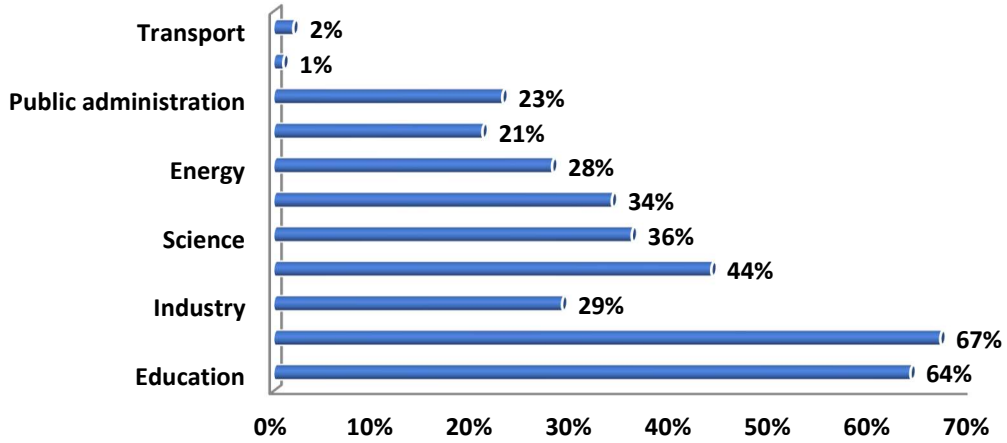

Diagram 5 – Economic Sectors Identified by Respondents as Lagging in Digital Technology Adoption (in %).

A significant number of respondents also pointed to **agriculture (44%)**, **science (36%)**, and **construction (34%)** as areas where digitalization is progressing insufficiently.

DISCUSSION.

The findings of the conducted sociological survey provide a comprehensive overview of the current state of digital literacy among the population of Uzbekistan and allow for the identification of both strengths and critical areas requiring development. As digital transformation accelerates across sectors, the level of user readiness and competence becomes a key determinant of the successful adoption of digital technologies at the national level.

The analysis reveals that the majority of respondents possess strong basic digital skills, with 85.25% demonstrating the ability to perform routine tasks such as installing software and using communication platforms. The equally high rate of internet accessibility (85%) indicates the broad availability of digital infrastructure, which has likely contributed to the widespread use of digital tools in everyday life. This foundational capacity provides a solid base for further digital advancement in the country.

In contrast, certain gaps were identified in more complex dimensions of digital literacy. For example, although 69.6% of respondents reported using various digital services and platforms, the adoption of advanced technologies—such as smart home systems—remains limited (9%). This discrepancy points to potential economic, informational, and competence-related barriers that hinder the integration of emerging technologies into domestic use.

A particularly concerning finding is the relatively low level of cybersecurity awareness. A significant share of respondents (42%) admitted that they do not verify website security before entering sensitive payment data, and 29% do not utilize two-factor authentication. These trends expose users to risks such as phishing, identity theft, and unauthorized account access, suggesting an urgent need for public education on digital safety practices.

The survey also revealed demographic disparities. While nearly half of the respondents were aged 20–29, only 11% represented the 50+ age group, even though this demographic accounts for 18.6% of the national population. This indicates a potential digital divide based on age and highlights the need for targeted policies to improve digital inclusion among older citizens.

Another dimension of the study involved public perceptions of digitalization across economic sectors. The highest levels of dissatisfaction were observed in the education (67%) and healthcare (64%) sectors, which respondents perceived as lagging in the implementation of digital technologies. This reflects not only the critical role these sectors play in everyday life but also the elevated expectations of citizens regarding service quality and technological integration.

Overall, the results underscore a dual narrative: on the one hand, Uzbekistan has made tangible progress in building digital competencies and promoting digital engagement; on the other, there remain structural challenges related to cybersecurity,

inclusiveness, and the adoption of innovative digital solutions. Addressing these issues will require a multi-pronged strategy, including the expansion of digital infrastructure, the simplification of digital public services, and the integration of digital literacy and cybersecurity training into educational curricula.

CONCLUSION.

Based on the analysis of the sociological survey results, the following key weaknesses in the digital literacy of the population of Uzbekistan can be identified. These issues require systemic solutions and targeted interventions within the framework of national digital policy:

- **Insufficient cybersecurity competence.** Users' vulnerability to phishing, hacking, and data leaks represents a systemic challenge rooted in limited awareness of basic digital hygiene practices. For example, the survey revealed that 42% of respondents do not verify the security of websites before entering personal or payment data—an indicator of high digital vulnerability.
- **Low penetration of advanced digital technologies.** According to the survey, only 9% of respondents use smart home systems. Among the reasons are high costs, lack of user experience, and limited awareness of AI capabilities. However, the problem is not purely economic—it is also educational. The lack of interest and readiness to adopt “smart living” highlights an uneven distribution of digital maturity.
- **Limited interaction with artificial intelligence.** Only 67% of respondents reported interacting with AI tools, indicating a narrow understanding of the potential applications of AI in everyday life.
- **Uneven digitalization across economic sectors.** From the public’s perspective, the least digitized sectors include education (67%), healthcare (64%), and agriculture (44%). These findings point to areas requiring priority attention in national digital development strategies.
- **Lack of attention to information perception and critical thinking.** Despite a high level of engagement with social media (95%), there is a notable absence of media literacy skills, making users susceptible to misinformation and manipulation. This underscores the need to integrate media hygiene and digital critical thinking into educational programs, particularly for younger generations.

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