

EVALUATION OF INSTITUTIONAL READINESS FOR DIGITAL TRANSFORMATION IN UZBEKISTAN: BUSINESS PERSPECTIVE

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Abstract. *This study evaluates the institutional readiness of enterprises in Uzbekistan for digital transformation from a business perspective. This research is based on a structured survey conducted among leading organizations with experience in implementing digital systems. The findings indicate that businesses are increasingly adopting digital technologies and artificial intelligence to enhance decision-making, particularly in the fields of marketing, sales, and predictive analytics. However, the results also reveal significant gaps in the strategic understanding and application of advanced digital solutions in areas such as financial management, logistics, and corporate decision-making.*

The study highlights that while government support and legislative frameworks are generally perceived positively, challenges remain in terms of technological infrastructure, data quality, and regulatory effectiveness. Additionally, limitations in financial resources and the need for further development of digital skills were identified as key barriers. Overall, the research concludes that Uzbekistan demonstrates moderate readiness for digital transformation, with strong potential for growth through improvements in governance, infrastructure, and the strategic implementation of digital technologies.

Keywords: *digital transformation, Institutional readiness, Artificial intelligence, ICT development, Digital economy, Business digitalization, Uzbekistan.*

Introduction

Rapidly emerging technologies and fast-paced changes omnipresent in today's world pose severe challenges for organizations while also offering groundbreaking opportunities for those able to capitalize on them in the modern age with globalization, technological development, and production facilities. There is no doubt that artificial intelligence (AI) applications will have a significant positive and negative influence on society in low- and middle-income countries (LMICs) (Stone et al. 2016). AI is a new class of technology that will form the foundation for future technologies and applications. AI applications, fueled by increased processing power, enhanced connectivity, and big data, present fascinating opportunities to support economic growth and address a wide range of long-standing challenges in the Global South. The consequent disruption will be significant and possibly transformative.

The growth and development of AI have led to an increase in its influence and impact on future economic and social changes (Feijóo & Kwon, 2020). According to the Digital Transformation Monitor of the EU (2017), the impact of AI on the economy could reach 13.3 trillion EUR by 2030. Research suggests that the implementation and development of AI could lead to an increase in labor productivity by up to 40% and considerable gains in retail, education, electric utilities, manufacturing, and healthcare. Based on the statistics, it can be observed that

during 2016-2019 revenues of the global market for AI increased 3.5 times, and by 2025, it is expected to grow to approximately 90 billion USD (Petrov, 2019). The development of AI could be implemented not only in the governmental aspect but also in organizations, bringing advantages such as managing the workforce by cost reduction (Pan et al., 2021), gaining customers and market positioning (Nam et al., 2020), and saving expenses (Gomes et al., 2020). The primary dilemma for AI developers is how to create technology that is both intelligent and human-centered (FLI() 2019). In other words, how can it be assured that technology is created in accordance with human values (Tegmark, 2017; FLI(b), 2019)?

The development of the digital economy in Uzbekistan is enforced by active government support within the implementation of the "Digital Uzbekistan 2030" strategy, which increased investments in digital infrastructure, enhancement of electronic government services, and the growth of the overall IT sector. Key trends include the implementation of artificial intelligence, cloud technologies, business automation, increased Internet accessibility, and the digitalization of financial services. Simultaneously, key success factors remain the need to ensure cybersecurity, eliminate digital inequality between industries and regions, and adapt organizational structures to new realities.

Methodology

The aim of this article is to evaluate the conditions and readiness of enterprises with most developed digital platforms and their experience in digitalization of business operations in creating the digital economy in Uzbekistan. To achieve objectives of the research, authors conducted a structured survey among 21 leading enterprise members with extensive experience in implementing and developing digital systems. Most respondents operated in IT and communications, whilst 14% worked in the education sector. This helped to obtain more accurate results, as they had a better understanding of the current state of ICT service development in the country and were able to share practical insights on the aspects that need to be developed for the successful implementation of promising digital solutions.

Survey questionnaire consisted of 18 questions. Qualitative survey outcomes were quantified and obtained numerical data set was analyzed using Exploratory Data Analysis (EDA) methods. Results of EDA are visualized and presented in appropriate charts. The article presented the most relevant finding that reflect the conditions and readiness of business units for digital transformation.

Findings

The study found that digital systems and artificial intelligence are most frequently used for predictive decision-making. Almost half of the companies have implemented high-tech digital systems in their marketing and sales processes. A third of the companies have implemented advanced digital systems for risk modeling and analytics, product portfolio optimization, operational services, customer relationship management, and human resources (Figure 1).

Significantly, it was revealed that some companies had limited experience and understanding of digital transformation and artificial intelligence in corporate strategic decision-making, financial management, logistics, and supply chain management.

However, a study of companies' strategies for implementing digital transformation of business processes and decision-making, as well as the use of artificial intelligence, concluded that a third of companies plans to implement advanced digital technologies to improve marketing and sales efficiency. A quarter of companies intend to implement digital decision-making technologies in image recognition, access control and accounting systems, video surveillance, scientific

research, and employee training (Figure 2). Overall, the results showed that economic entities have a limited understanding of the potential of using advanced digital decision-making systems and artificial intelligence.

Figure 1. Use of digital decision-making platforms in management decision-making.

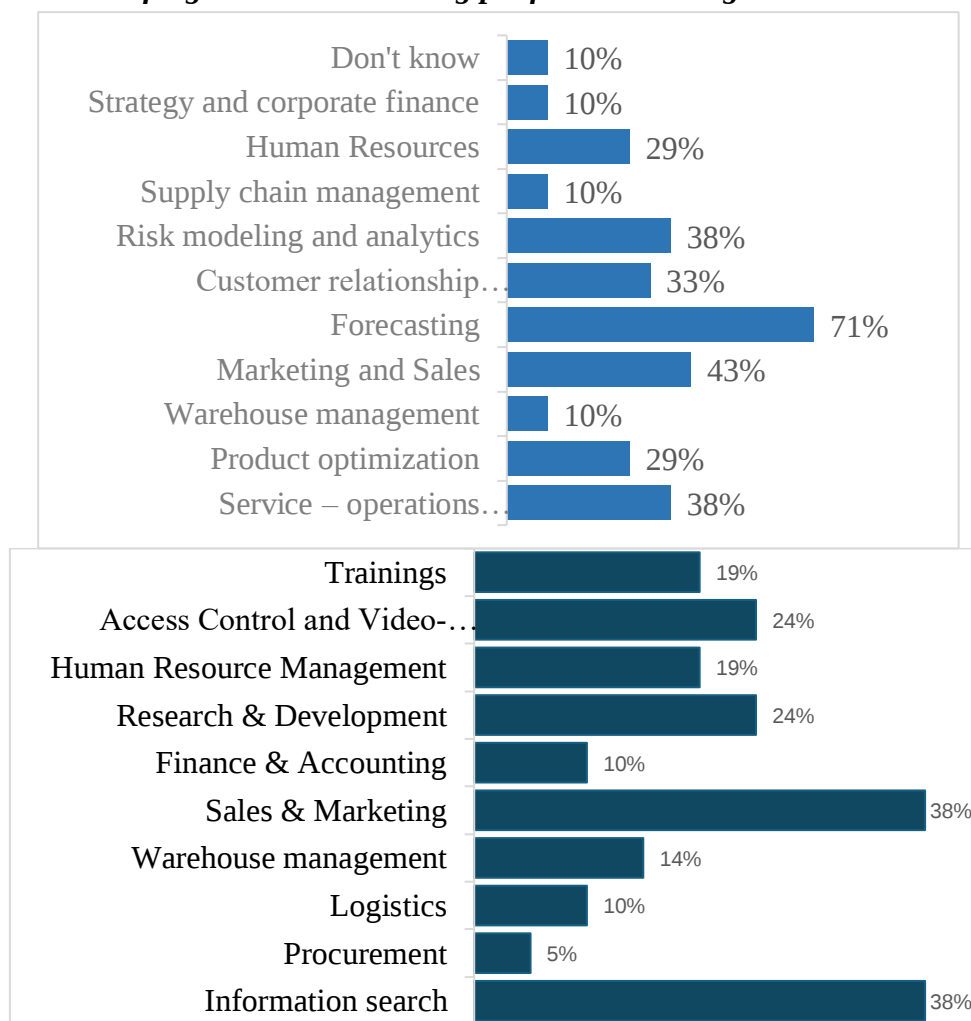


Figure 2. Strategic plans of enterprises for the use of digital transformation and artificial intelligence.

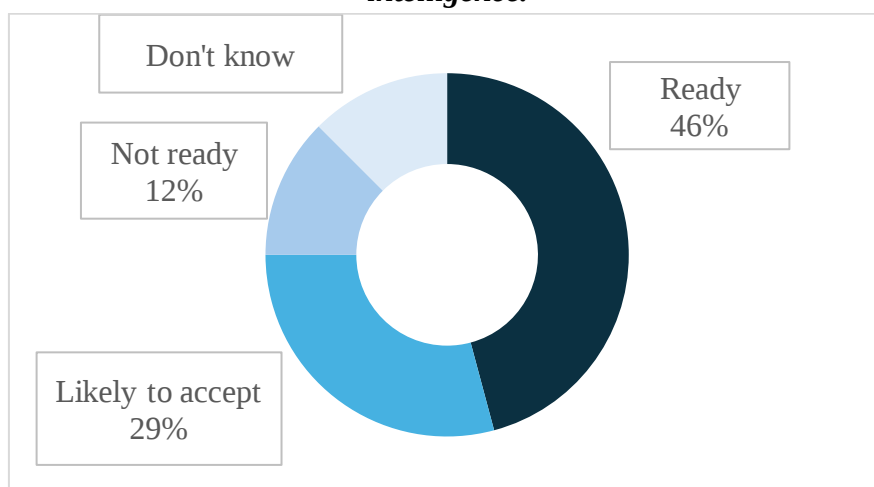


Figure 3. Readiness of enterprise clients to use digital platforms.

A survey of an equally important part of the digital ecosystem—customers and service users—revealed that 75% of respondents acknowledged their readiness to use advanced digital

solutions (Figure 3). This demonstrates that consumers welcome the implementation of modern digital transformation and decision-making solutions and are willing to use them in economic transactions.

The existence of an open and effective legislative framework for the implementation of artificial intelligence and digital decision-making platforms is the most important prerequisite for the development of the digital economy. Countries have created and are developing a set of legislative measures to accelerate the growth of digital economy. In Uzbekistan, business perceived this issue more positively (Figure 4). More than three-quarters of businesses positively assessed legislative support for expanding digital business transformation, particularly in terms of cybersecurity, personal information and data protection, consumer protection, and e-transformation. However, half of respondents had a more moderate assessment of the legislative framework for consumer protection. One-fifth of businesses indicated that the existing legislative framework for ensuring cybersecurity, personal information and data protection, and consumer protection is insufficient.

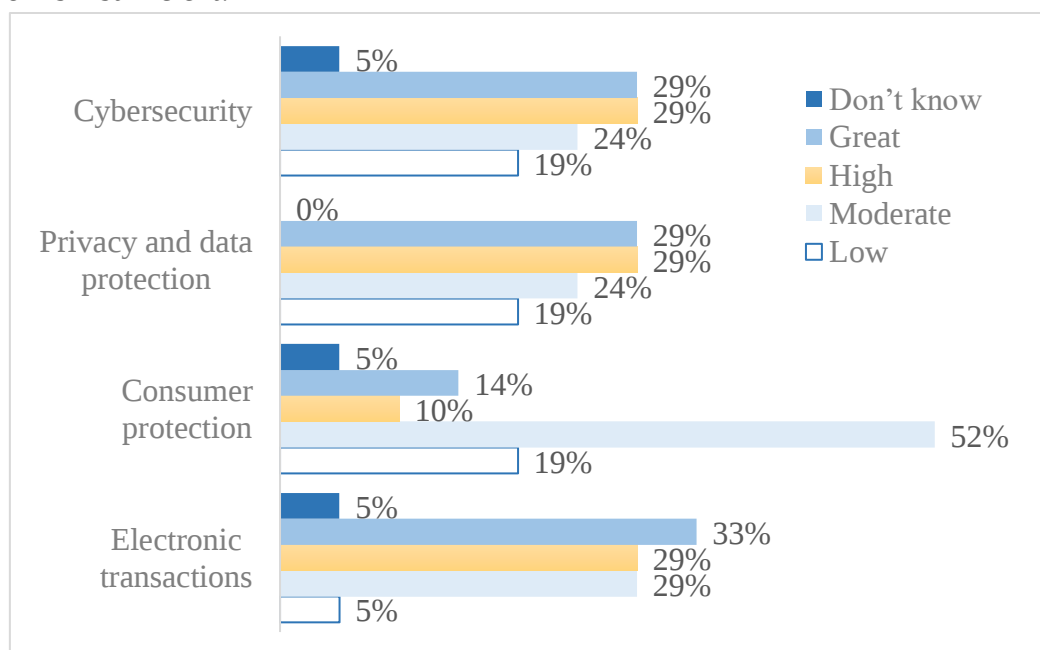


Figure 4. Enterprises' perception of legislative support for important aspects of digital business transformation.

Government regulation of digital economy development is a primary tool for encouraging enterprises' readiness for digital transformation. The effectiveness of government measures to promote digital transformation is generally positively accepted by enterprises (Figure 5). However, enterprise responses indicate that there is significant room for improvement in the effectiveness of government measures to develop the digital economy. Most enterprises trust government web resources and support the development of online services. Government support for promoting investment in promising technologies is also positively perceived.

The technological foundation for the digital economy and its development in the country is an important aspect of supporting the digital transformation of enterprises. In this regard, more than half of enterprises assessed Uzbekistan's technological readiness less optimistically, citing many challenges in developing cloud technologies, implementing advanced technologies, and

increasing internet speeds (Figure 6). The country's telecommunications infrastructure was assessed more positively.

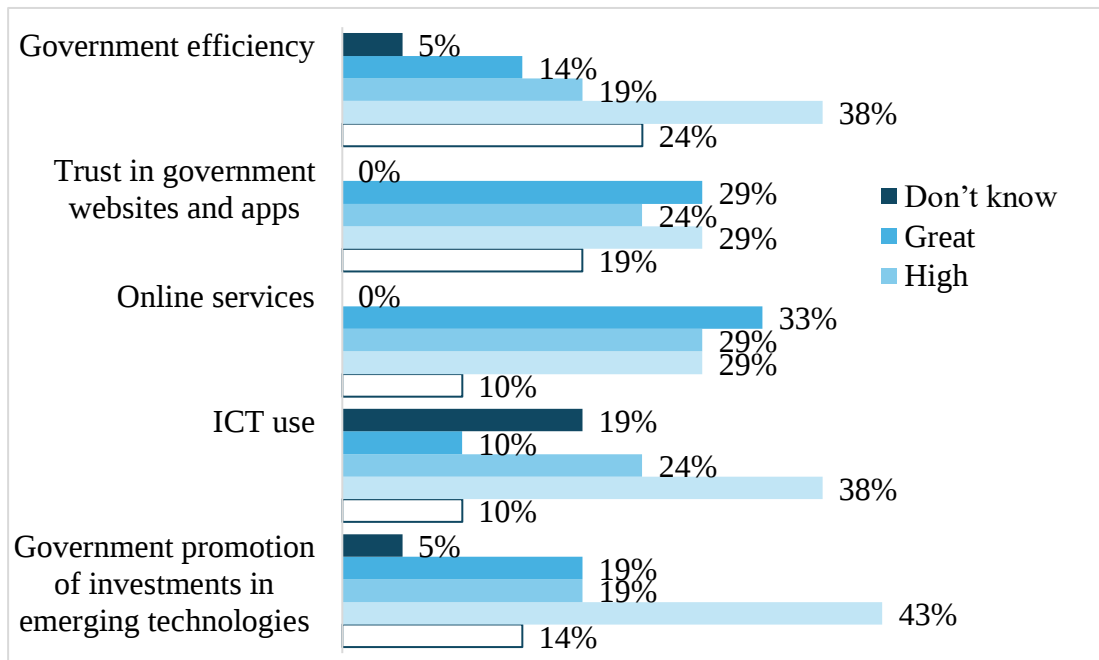


Figure 5. Perception of Uzbek enterprises of government measures to develop digital transformation.

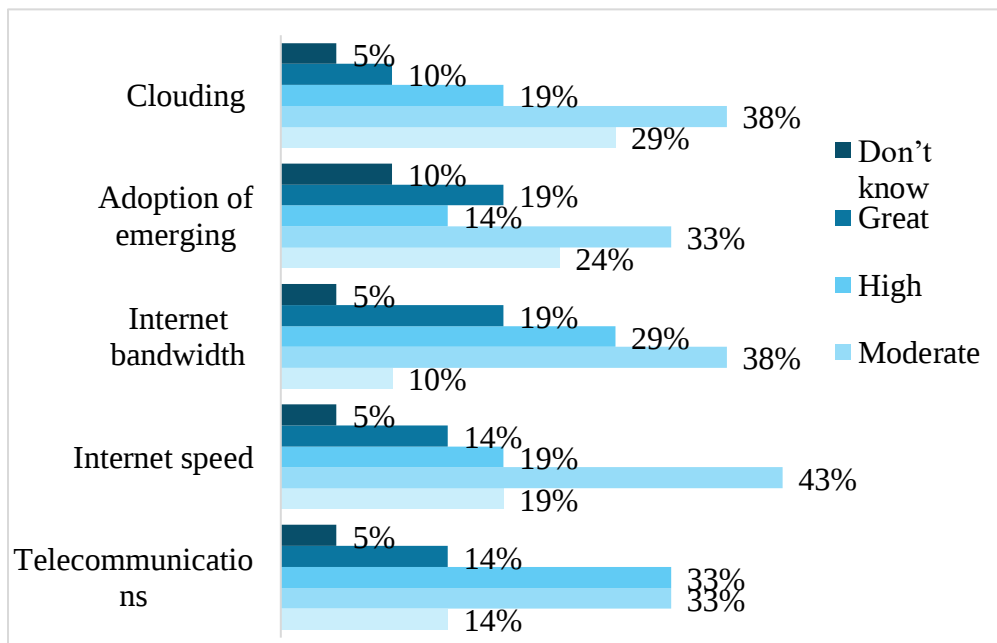


Figure 6. Assessment by enterprises of Uzbekistan's technological readiness for the development of digital transformation.

Respondents had been also asked to rate the following aspects of the country's data potential analysis within the range of from least (1) to most (4): open government data, strategic data potential, mobile subscriptions, and internet accessibility (Figure 7). The survey results showed a growth in the strategic potential of digital platforms and internet accessibility, as well as mobile data subscriptions. However, enterprises suggested improving and deepening efforts in open data provision, including data related to government services, population data, and geospatial data.

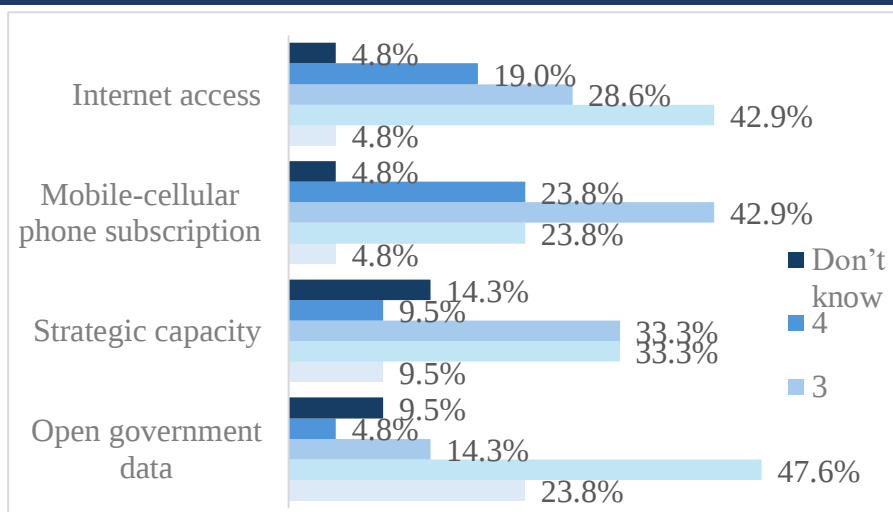
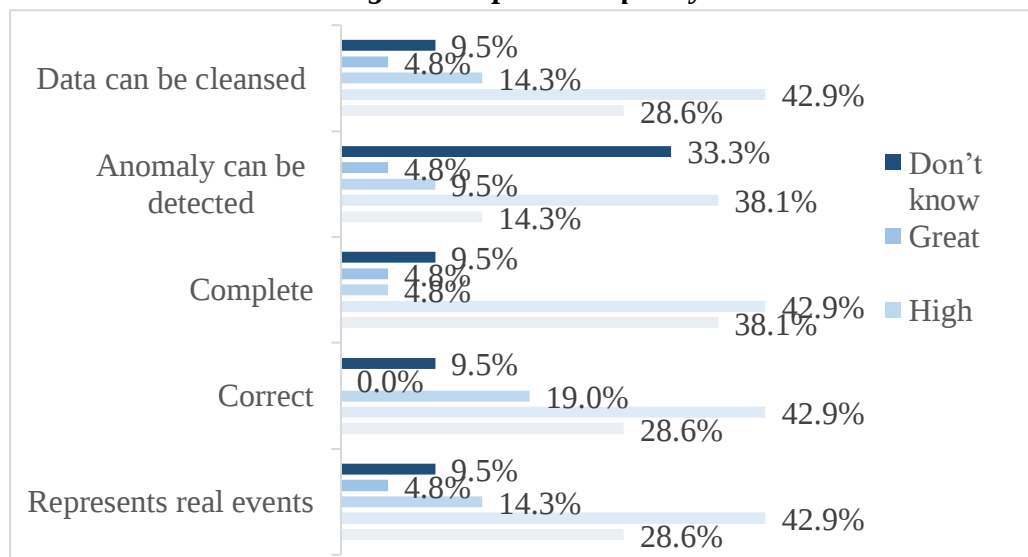


Figure 7. Enterprises' perception of the level of the national ICT platforms for the development of digital transformation.

Figure 1. Open data quality evaluation.



Enterprises assessed the quality of existing open data in terms of its completeness, accuracy, representativeness of real-world events, anomaly detection, and cleansing capabilities (Figure 8). The results indicate that the quality of open datasets is low, as approximately 45% of participants rated the development of all quality aspects as moderate.

Financial and human resources are central assets for any digital transformation. In this part, business entities were asked to answer two questions regarding the country's budget and human resources. Financial resources were assessed based on the allocated budget, willingness to invest in high-risk AI technologies, and budget constraints (Figure 9).

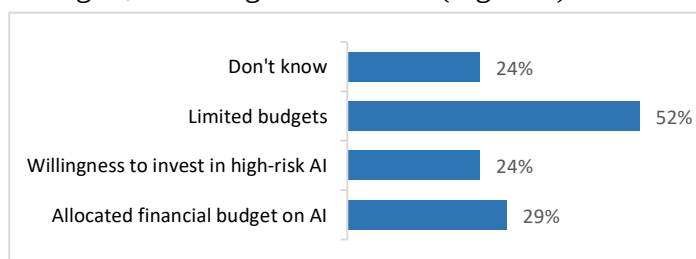


Figure 2. Assessment of investment capabilities of enterprises to maintain digital transformation.

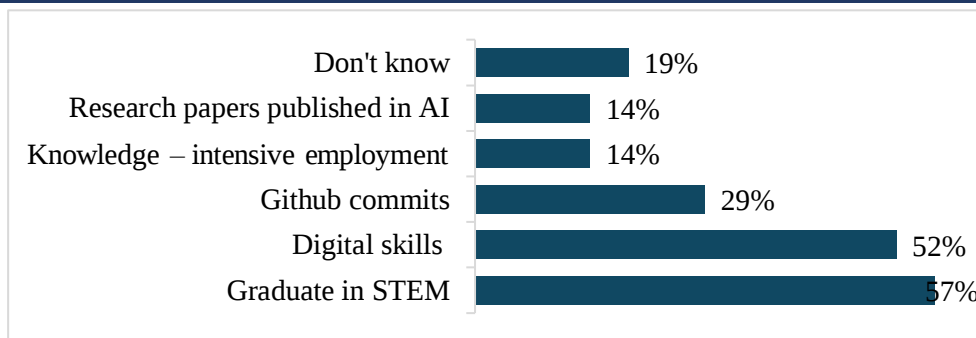


Figure 3. Assessment of qualified personnel to develop digital transformation in Uzbekistan.

To analyze the availability and readiness of specialists to implement AI, participants were asked questions about STEM graduates, GitHub commits, published articles on AI, knowledge-intensive employees, and their digital skills (Figure 10). Most organizations believed that the country's budget for digital transformation is limited, while qualified employees capable of contributing to the development of advanced digital technologies are available, as more than half of the participants indicated the availability of STEM graduates and employees with digital skills.

Conclusion

The primary objective of the study was to determine how advanced digital technologies are used in the country, whether organizations are ready to embrace AI-based technologies, and to what extent they should be developed in Uzbekistan. The results of this study demonstrate that the sector is evolving year after year, with more and more organizations successfully implementing information systems in their business operations, acknowledging the benefits these technologies offer. This is evident in the shift in respondents' opinions: while at the beginning of the development, most participants viewed digital systems primarily as a cost-reduction tool, in later stages, an increasing number of companies stated that information systems impact efficiency and improve decision-making. Furthermore, the scope of information systems adoption in organizations is expanding, with the increasing number of companies implementing technologies nationally and internationally, in line with the implementation of integrated information systems at the corporate level.

Enterprises' interest in ICT technologies is growing, as majority respondents plan to improve existing digital systems and also integrate other types of technologies into their business processes. In particular, interest in artificial intelligence is growing, indicating the country's growing readiness to implement promising technologies, though the pace of this process could be more dynamic. In terms of strategic alignment, organizations and their clients demonstrate higher results, while the governance system needs to improve compliance with regulatory requirements and ethical standards. The same can be said for ICT infrastructure, as most participants rate the country's technological potential at low to medium levels. Some developments in data processing are leading to slightly higher results compared to governance systems and technological areas, but some concerns remain related to data availability and quality.

In conclusion, it can be said that Uzbekistan is developing and preparing to implement advanced technologies for digital transformation and development of the digital economy with moderately high expectations from organizations and users. Areas in which the country needs to improve for the successful implementation of artificial intelligence include regulation, ethics, data accessibility, openness, and quality. The demand for advanced digital technologies for information

sourcing, sales and marketing is higher than in other industries, and this could be a good starting point for further development, as the country has qualified resources to develop this sector.

REFERENCES

1. European Monitor of Industrial Systems (2017). Harnessing the economic benefits of Artificial Intelligence, <https://monitor-industrial-ecosystems.ec.europa.eu/reports/other-reports/harnessing-economic-benefits-artificial-intelligence>
2. Feijóo, C., Kwon, Y. (2020). AI impacts on economy and society: Latest developments, open issues and new policy measures. Telecommunications Policy, 44(6), <https://doi.org/10.1016/j.telpol.2020.101987>.
3. Gomes, M.G., Carlquist da Silva V.H., Pinto L.F., Silva P.C. (2020). Economic, environmental and social gains of the implementation of artificial intelligence at dam operations toward Industry 4.0 principles. Sustainability 12, 3604, DOI:10.3390/su12093604);
4. Nam, K., Dutt, C.S., Chathoth, P., Daghfous, A., Khan, M.S. (2020). The adoption of artificial intelligence and robotics in the hotel industry: prospects and challenges. Electronic Markets, 31, September 1–22, DOI:[10.1007/s12525-020-00442-3](https://doi.org/10.1007/s12525-020-00442-3);
5. Pan, Y., Froese, F., Liu, N., Hu, Y., Ye, M. (2021). The adoption of artificial intelligence in employee recruitment: the influence of contextual factors. International Journal Human Resource Management, 25, February, 1–23, DOI:10.1080/09585192.2021.1879206;
6. Petrov, A. A. (2019). Opportunities and directions for the development of the digital economy in Russia and the blocking factors of its development. Actual problems of Russian law, 3(100), 45-66, <https://doi.org/10.17803/1994-1471.2019.100.3.045-066> ;
7. Stone, P., Brooks, R., Brynjolfsson, E., Calo, R., Etzioni, O., Hager, G., and Teller, A. (2016). Artificial intelligence and life in 2030. *One Hundred Year Study on Artificial Intelligence: Report of the 2015–2016 Study Panel*. Stanford University, Stanford, CA, September 2016. stanford.io/2HYuZrUTegmark,
8. Tucker Davey T. (2018). AI Policy Challenges And Recommendations, Future of Life Institute, <https://futureoflife.org/ai-policy-challenges-and-recommendations/> ;