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THE CURRENT STATE OF THE LEVEL OF DIGITALIZATION OF THE PUBLIC ADMINISTRATION SYSTEM OF THE REPUBLIC OF ARMENIA

Localizing digital technologies in the country's public administration system is one of the key prerequisites for enhancing its efficiency and ensuring transparency and accountability. The article's main purpose is to assess the current state of digitalization of the economy and the public administration system of the Republic of Armenia by studying the main indicators of national statistical bodies and international reports. International indexes, like the Network Readiness Index and the E-Government Development Index, have classified the degree of digitalization of Armenia's state system as average, highlighting the importance of several initiatives and measures implemented. Within the framework of the article, a three-level pyramid was also proposed to evaluate the digitalization situation of the state system of Armenia. According to that analysis, measures aimed at e-governance in the state system of Armenia are at a fairly good level, initiatives in digitization have just begun to appear, and clear, concrete steps and mechanisms are needed in the direction of digital transformation. The main results of the analysis show that the availability of investments, a stable digital environment, and the prerequisites for continuous education are of great importance for the digitalization of public administration in Armenia.

Keywords: *digitalization, public administration, Armenia, e-government, digital transformation, digital ecosystem, strategic investments* JEL: D73, O33

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INTRODUCTION. In the modern world, the use of digital technologies is a key prerequisite for increasing efficiency and ensuring transparency and access to public services in the public administration systems of countries. Armenia also participates in these processes to a certain extent. Especially in recent years, the Armenian government has carried out a number of reforms and measures aimed at the use of digital technologies by public administration bodies. In this context, it becomes important to study and analyze the impact and effectiveness of these reforms through a comprehensive assessment of the current situation with digitalization in the field of public administration in Armenia. This analysis is also important in terms of identifying the main obstacles to the digitalization of the public administration system and working out ways to solve them.

LITERATURE REVIEW. Numerous studies have emphasized that digital transformation has great potential to simplify economic processes (Velinov et al., 2020), while on the other hand, it can create quite serious obstacles to internationalization (Hannibal et al., 2018). Digital transformation allows economies to achieve greater flexibility, make production processes more efficient, create value propositions for innovative ecosystems, and respond timely to market needs (Shpak et al., 2020).

Several theorists (Bukht et al., 2017) have outlined direct links between technological changes and economic growth, and it is considered indisputable that technological innovation is the main driving force of economic growth. The term "digital economy" was first used in economic literature in 1995 by Don Tapscott, who interpreted the concept as follows: "The digital economy is a type of economy based on the use of digital technologies" (Tapscott, 1995). In turn, the Department of Communications and the Digital Economy of Australia defines the digital economy as a global network of economic and social activities carried out through various platforms of information technologies (Shpak et al., 2020). According to a Deloitte analytical review, the digital economy is presented as a new form of business activity for market system participants, based on network interaction via the Internet (Deloitte Insights, 2018). The digital economy has been defined as a means of conducting market relations, considering the current innovative patterns of growth in information and computer solutions (Collis et al., 2019). According to another definition, the digital economy is described as a new business model for the structure of national and global economies and is based on information technologies, intellectual capital, intangible assets, and innovation (Besada, 2018).

Especially after the outbreak of the COVID-19 pandemic, the role and significance of the digital economy in the global economy have become more pronounced. Some analyses have documented (Banga, 2020) that the digital economy has played an enormously positive role in preventing and controlling the pandemic, in the efficiency of distribution and redistribution processes in global supply chains, and in ensuring economic development. During the

COVID-19 pandemic, digital services have acquired most of the resources redistributed from traditional industries, which has become a strong driver of accelerated growth (Gonichev et al., 2021). Furthermore, another study has found that digital technologies have not only empowered pandemic response strategies in the short term but have also served as a technological cornerstone for the "internet-based" industry and consumption in the long term (Jiang, 2020). The process of digital transformation of the economy has been presented as a key factor for all economic entities that aspire to have sustainable development opportunities in the global economy (Gribanov, 2019). Moreover, digital transformation processes are important for maintaining market competitiveness and staying at the forefront of technological innovation (Queiroz et al., 2020). The Fourth Industrial Revolution has ushered the era of digitalization into the global economy (Alcácer et al., 2019).

A scientific basis for the domain of digital governance has been called for in recent works (Charalabidis & Lachana, 2020). Establishing a strong conceptual framework plays a crucial role in building this foundation. The concept of digital governance can be understood as a progression or advancement of the eGovernance (electronic governance) paradigm (Misuraca & Viscusi, 2014). Bannister and Connolly (2012) observed that the term eGovernance had been applied with significant flexibility within academic literature. They pointed out that this lack of precision was problematic, leading to the absence of a universally accepted definition. Their analysis particularly highlighted the indistinct boundaries between eGovernance and eGovernment, noting that the two concepts were frequently used interchangeably or inconsistently in scholarly discussions. Digital governance is enabled through the use of digital technologies, encompassing various combinations of information, communication, and connectivity tools (Bharadwaj, et al., 2013). It emphasizes the application of advanced digital systems capable of processing data essential for value-driven exchanges, such as sophisticated databases like blockchains (Lumineau et al., 2021). Additionally, digital governance relies heavily on heuristics and autonomous decision-making mechanisms, employing complex systems such as matching algorithms and artificial intelligence to ensure the seamless continuation of exchanges.

In the Republic of Armenia, digitalization processes are at a low level of development. The scale of the digital economy is still limited. The programs and strategies announced over many years have not provided sufficient results, and among comparable countries, Armenia occupies positions below average. Implementing the digital agenda and launching breakthrough digital projects will allow Armenia to achieve significant economic results, for which consistent work implemented at the state level is important (Minasyan et al., 2022).

At the same time, it is necessary to note that no single general approach, in theory, reflects the peculiarities of digital transformation and the complete scope of its impacts. Thus, the digital economy can be summarized as the entirety of economic, social, and cultural systems based on the penetration of technologies and the processes that have emerged as a result.

RESEARCH METHODOLOGY. The article is cognitive and descriptive and aims to provide a comprehensive understanding of digitalization initiatives in Armenia through the analysis of current data, publications, and indices A comprehensive study to understand the theoretical foundations and international perspectives of digitization and their impact on public administration systems obtained secondary data. An analysis of Armenia's readiness to use the network readiness index was carried out. The indicators of Armenia in the field of online services and telecommunication infrastructure were evaluated based on the digital quality of life index parameters that affect Armenia's digital well-being, with an emphasis on Internet access, quality, e-infrastructure, security, and public services (Cybersecurity Index) assess Armenia's commitment to cyber security in terms of legislative, technical, organizational measures, capacity building, and cooperation. The GovTech Maturity Index assesses the government's implementation and use of digital technologies to deliver public services.

This study employs a qualitative and descriptive research approach to systematically evaluate the current state of digitalization in Armenia's public administration system. The methodology has been designed to comprehensively assess digitalization initiatives, identify progress and limitations, and provide actionable insights to advance digital integration.

The primary aim of this research is to develop a comprehensive understanding of Armenia's digitalization efforts by analyzing existing data, indices, and international frameworks. The specific objectives are as follows:

- ✓ To evaluate Armenia's readiness for digital transformation using internationally recognized indices and parameters.
- ✓ To identify the strengths and weaknesses of Armenia's digitalization initiatives.
- ✓ To conduct a comparative analysis of Armenia's digitalization performance relative to its regional and global peers.

A conceptual three-level pyramid model was developed to categorize Armenia's digital integration into the stages of e-governance, digitization, and digital transformation. This model provides a structured framework for analyzing the progression of digital initiatives within the public administration system. Data from various reports, indices, and literature were used to interpret qualitative content analysis. This required the integration of quantitative data from the literature and qualitative information from international reports. This study has used a methodological approach that contributed to the comprehensive analysis of the state of digitalization in Armenia. The research uses a literature review, secondary data analysis, comparative analysis, and qualitative content analysis to provide a substantive understanding of Armenia's achievements and obstacles. ANALYSIS. The institutional and organizational foundations of digitization and digital transformation in Armenia are at an active stage of development. The strategies and programs adopted by the government have defined the main directions and goals of digitization, which are aimed at increasing the efficiency of the state administration system and increasing the accessibility of public services. The legal framework regulating the sector has improved significantly over the years, ensuring security, compatibility, and protection of personal data. The need for targeted efforts remains relevant, which should be aimed at increasing the digital literacy of society, developing interdepartmental cooperation, active public involvement, and strengthening cyber security. In context, the Network Readiness Index is widely used to assess countries' ICT for economic growth, innovation, and social well-being. The 2023 report by the Portulance Institute presented the digital processes in 134 countries to assess the readiness of those countries to make the most of the opportunities of the digital revolution. The network readiness index generally consists of four main components, each of which has a set of indicators (Dutta et al., 2023). Taking into account the main object of analysis of this article, a comparative analysis has been conducted of both the Network Readiness Index and the "Governments" indicator of its "People" pillar. Moreover, the "Governments" indicator shows ICT investments in the public sector and their distribution for serving the population (Dutta et al., 2023).

Table 1

<i>c i</i>	Network Rea	diness Index	"Governments" indicator			
Country	Position	Score	Position	Score		
USA	1 st	76.91	3rd	78.85		
Singapore	2nd	76.81	11 th	71.30		
Russia	38th	57.27	30 th	51.53		
Turkey	47th	53.22	44 th	47.18		
Kazakhstan	58th	50.97	48 th	45.27		
Armenia	63th	49.36	53 th	43.18		
Azerbaijan	75th	45.57	52 th	43.25		
Georgia	78th	45.25	87 th	32.71		
Iran	87th	42.83	96 th	27.87		
Kyrgyzstan	94th	39.80	107 th	22.36		

Comparison of Network Readiness Index and "Governments" indicator in Armenia and several countries (among 134 countries), 2024*

* Source: Network Readiness Index 2024, available at: https://download.networkreadinessindex.org/reports/data/2024/nri-2024.pdf

Table 1 shows that the leader in the Network Readiness Index in 2023 is the USA, which has taken the 3rd place in the world in the "Governments" indicator. On the other hand, Armenia occupies 63rd place among 134 countries in the Network Readiness Index and 53rd place in the "Governments" indicator. Armenia's position shows that the government has taken some steps in the field of ICT investments, but there is still considerable potential for improvement. In

general, digital governance, especially at the national level, is of key importance as it allows public functions and services to become accessible, efficient, and transparent to the population. The Department of Economic and Social Affairs of the United Nations, highlighting the role and importance of digital processes in the public administration systems of countries, developed the e-Government Development Index, published in 2001. The e-government development index consists of three main components:

- 1. Online Services Index,
- 2. Telecommunications Infrastructure Index,
- 3. Human Capital Index (United Nations, 2024).

The 2024 report assessed the levels of e-government development in 193 countries, where Armenia ranked 48th with a score of 0.8422. Armenia's achievements in the field of e-government testify to the significant steps taken by the country's state bodies in the direction of digital transformation. Compared to neighboring and other countries, Armenia has made some progress, but further efforts are still needed to be closer to international leaders. The report states that within the framework of the 2021-2026 program of the Government large significant projects, such as the unified platform of electronic public services, the center of excellence in cyber security, the system of electronic tax reports and the platform of electronic healthcare. Among EAEU member states, Kazakhstan is the leader in the e-government development index, ranked 24th among 193 countries with an index of 0.9009. The main reason for this is the digital projects implemented by the government of Kazakhstan, which are aimed at increasing the availability of digital services and digitizing the economy's management.

Table 2

several countries, 2024									
Country	E-Gove Developm	rnment ent Index	Online Services Index	Telecommunications Infrastructure Index	Human Capital				
D 1	Position	Score	Index	0.0504	Inuex				
Denmark	lst	0.9847	0.9992	0.9584	0.9966				
Estonia	2nd	0.9727	0.9954	0.9497	0.9731				
Singapore	3rd	0.9691	0.9831	0.9362	0.9881				
Kazakhstan	24th	0.9009	0.9390	0.9235	0.8403				
Turkey	27th	0.8913	0.9225	0.8322	0.9192				
Russia	43th	0.8532	0.7766	0.9512	0.8319				
Armenia	48th	0.8422	0.7922	0.8782	0.8561				
Georgia	69th	0.7792	0.5652	0.9071	0.8654				
Azerbaijan	74th	0.7607	0.7386	0.8203	0.7233				
Kyrgyzstan	78th	0.7316	0.6072	0.8815	0.7061				
Iran	101th	0.6564	0.3773	0.8987	0.6932				

*E-Government Development Index and its components in Armenia and several countries, 2024**

* Source: E-Government Development Index, available at: https://publicadministration.un.org/egovkb/Data-Center Denmark has retained its position as the top-ranked country, achieving the highest E-Government Development Index score of 0.9847. According to the report, Denmark's success is anchored in its holistic approach to governance, where digital initiatives are seamlessly integrated into various sectors such as healthcare, public services, and education. The country's government portals are widely recognized for their user-friendliness, accessibility, and comprehensive range of services, from tax payments to healthcare access.

Estonia was second in e-government development with a score of 0.9847. Estonia's leading position in the development index is mainly due to the provision of exceptional online services and reliable telecommunication infrastructure with projects such as e-Estonia, which cover a wide range of digital services and promotes active participation of citizens in digital processes (e-Estonia Information Center official website), the development of e-government in the field of e-governance includes some projects aimed at The Digital Quality of Life Index calculates the factors that affect countries' digital well-being, identifying areas that require key development attention. The 2023 Digital Quality of Life Index presents 121 indicators of countries (92% of the world's population) according to five main principles:

- Internet Availability
- Internet Quality
- Electronic Infrastructure
- E-Governance
- E-Security (Digital Quality of Life Index, 2023).

The analysis of the digital quality of life index and its components shows that the EAEU member countries have recorded different levels of development, which is especially pronounced in terms of the quality of the Internet and infrastructure. Kazakhstan ranks relatively high in terms of Internet access, while the components of e-infrastructure and e-security are relatively low.

Digital Quality of Life Index and its components in Armenia and several countries, 2023*

Country	Digital Quality of Life Index		Internet affordability		Internet quality		Electronic infrastructure		Electronic security		Electronic	
											government	
	Position	Score	Position	Score	Position	Score	Position	Score	Position	Score	Position	Score
France	1st	0.79	1-ին	0.65	5th	0.57	16th	0.91	13th	0.95	11th	0.88
Finland	2nd	0.75	11th	0.43	24th	0.46	8th	0.96	11th	0.95	3th	0.94
Denmark	3rd	0.74	29th	0.27	4th	0.57	2th	0.98	13th	0.95	5th	0.93
Kazakhstan	47th	0.53	10th	0.08	61th	0.07	53th	0.15	86th	0.07	44th	0.15
Russia	53th	0.5	69th	0.03	51th	0.08	46th	0.16	56th	0.09	47th	0.14
Turkey	55th	0.5	65th	0.03	77th	0.08	50th	0.15	53th	0.09	33th	0.15
Georgia	65th	0.46	48th	0.04	102th	0.05	55th	0.15	43th	0.11	80th	0.11
Armenia	69th	0.45	42th	0.04	87th	0.06	74th	0.14	74th	0.14	70th	0.12
Kyrgyzstan	71th	0.44	6th	0.10	88th	0.06	98th	0.11	93th	0.06	85th	0.10
Azerbaijan	74th	0.42	87th	0.02	93th	0.06	66th	0.14	64th	0.08	78th	0.11
Iran	95th	0.33	68th	0.02	104th	0.05	58th	0.15	120th	0.02	92th	0.09

* Source: Digital Quality of Life Index, available at: <u>https://surfshark.com/dql2023</u>

In the EAEU countries, Kyrgyzstan holds a fairly high position in the Internet affordability component (6th place among 121 countries), while Russia significantly lags, occupying 69th place among 121 countries. Armenia occupies an average position both in the region and among EAEU countries. Thus, in the digital quality of life index 2023, Armenia ranked 69th in the world, 42nd in Internet access, 87th in Internet quality, 74th in e-infrastructure and e-security, and 70th in e-government. The analysis shows that the leading countries, France, Finland, and Denmark, have comprehensive and developed digital infrastructures and services. Among EAEU countries, Kazakhstan is a leader, especially in Internet access, while Armenia and Georgia in our region need improvement, especially in terms of Internet quality and electronic infrastructure. In the modern information society, cyber security has become a vital factor for the economic development of countries and the efficiency of public administration systems. The Global Cybersecurity Index (GCI) is an international benchmark assessing countries' cybersecurity commitment. In the 2023 GCI report, the cybersecurity situation of 194 countries was evaluated through five pillars:

- Legal Measures,
- Technical Measures,
- Organizational Measures,
- Capacity Building,
- Cooperation (International Telecommunication Union, 2024).

The significance of this indicator for Armenia is multifaceted, affecting the main aspects of ensuring the digitalization of the economy and public administration. A high level of cybersecurity is extremely important to increase investor confidence, protect the national economic system, and protect citizens' personal data. Armenia's 20 maximum legal measures aimed at cybersecurity were rated at 17.22 points. The competitiveness of the legal field in Armenia shows, that the necessary laws and regulations exist. For example, in 2023, the RA Law «On Cybersecurity» (a single website for publishing draft legal acts) was developed, whose purpose is to create a secure cyber environment in information systems and important information infrastructures used to ensure vital ones. At the same time, it is necessary to ensure the continuity of efforts directed at improving the legal field in the cybersecurity sector by updating laws and introducing international standards. Under the next pillar of the Global Cybersecurity Index, Technical Measures, Armenia was evaluated at 8.69 points out of a maximum of 20 in 2023 (International Telecommunication Union, 2024). The inadequacy of technical capabilities can lead to increased vulnerability to cyber threats. In this context, investments in developing modern cybersecurity technologies and infrastructures become vital in Armenia. The next pillar is Organizational Measures, with a score of 2.81 points in 2023 (International Telecommunication Union, 2024). In Armenia, there is essentially a lack of effective management in the cybersecurity sector, which needs to be implemented

through a centralized coordination model. Capacity Building in the field of cybersecurity in Armenia was evaluated at 10.35 points in 2023 (International Telecommunication Union, 2024). Effective and tangible steps in this direction can include improving the education system and professional retraining programs. The lack of human capital is one of the key challenges hindering the development of cybersecurity in Armenia. The last pillar of the Global Cybersecurity Index is Cooperation, where Armenia received 14.74 points out of a maximum of 20 in 2023 (International Telecommunication Union, 2024). In this direction, it is characteristic for Armenia to invest resources and undertake concrete steps towards developing international cooperation avenues. An important initiative in ensuring cybersecurity in Armenia is the formation of the National Incident Response Team AM-CERT, whose mission is to study and coordinate responses to cybersecurity incidents in Armenia's national critical infrastructures (National CERT/CSIRT Armenia). The World Bank publishes the GovTech Maturity Index (GovTech Global Partnership, 2022), which evaluates governments' adoption and use of GovTech (government technologies) based on four components:

- Core Government Systems,
- Public Service Delivery,
- Citizen Engagement,
- GovTech Enablers (Policies and Regulations).

This indicator allows you to assess how effectively the government uses digital technologies to provide public services. In the 2022 report, Armenia was among the 46 countries in group B. This means that considerable attention is paid to improving state technologies in Armenia. Thus, in the modern world, integrating digital technologies into public administration has become a necessity. This contributes to increasing the efficiency of administration, ensuring transparency, and increasing the availability and quality of public services.

To assess the level of digitization of the public administration system in Armenia, a three-level pyramid model was proposed (Figure 1), which reflects the phased development of the integration of digital technologies in the country's public administration system. The pyramid of the level of digitization of the RA public administration sector serves as a conceptual framework specifically designed to evaluate the progression of digital integration within the Republic of Armenia's public administration system. This model categorizes digitalization into three distinct stages: e-governance, digitization, and digital transformation. Each level represents a different degree of technological adoption and integration, reflecting the evolution of digital initiatives.

✓ E-Governance: This foundational stage involves implementing online services and platforms to enhance administrative efficiency and transparency. Armenia has demonstrated significant progress in this area, as evidenced by its performance in the E-Government Development Index, where it ranks 48th globally. It also has notable scores in the Online Services Index.

- ✓ Digitization: At this intermediate stage, existing processes and services are transitioned to digital formats, supported by enhanced infrastructure and data management systems. Indicators include Internet quality, einfrastructure, and cybersecurity measures. Armenia's position as a medium-level country reflects ongoing initiatives such as the expansion of broadband access and cybersecurity projects. However, challenges persist, particularly in rural areas where infrastructure development lags.
- ✓ Digital Transformation: The highest stage focuses on the holistic integration of digital ecosystems to enable seamless, data-driven decision-making and innovation. This stage involves advanced AI applications, interdepartmental collaboration, and citizen-centric services. Armenia has yet to achieve this level, as evidenced by gaps in advanced digital ecosystems and limited public-private collaboration.



Figure 1. The pyramid of the level of digitization of the RA public administration sector⁴

This model allows a comprehensive assessment of the country's progress in the field of digital technology integration and determines the main directions of development. Thus, in the modern world, the integration of digital technologies in public administration has become a necessity, which contributes to increasing the efficiency of management, ensuring transparency, as well as the availability and quality of public services. To evaluate the level of digitalization of the public administration system in Armenia, a three-level pyramid model was proposed, which reflects the phased development of the integration of digital technologies in the country's public administration system in the field of digital technology integration and determines the main directions of development. Thus, at least at this moment, the level of digitalization in Armenia's public administration system is average. The development of a centralized data management system based on

⁴ This pyramid structure is a suggestion made by the author.

international data collection, storage, and exchange standards is of key importance for increasing the level of digitization of the state system of Armenia. From the point of view of the pyramid's digital transformation level, Armenia is still at the initial stage. The main problem that remains for the effective implementation of digital transformation processes in Armenia is the lack of a digital ecosystem. In the context of the implementation of digital transformation, it is necessary to form effective and functional cooperation platforms between the public and private sectors with a common vision and approach. Thus, the analysis of the three-level pyramid of the level of digitization of the public administration system of Armenia shows that positive results have been recorded in certain areas, but some serious challenges require complex and systemic solutions.

CONCLUSIONS. The comprehensive analysis of the digitization level of the Armenian economy revealed significant problems, which makes it difficult for experts and researchers to analyze the current state of digitalization, the ratings are often related to the ratings of Armenia in various international indexes and sectoral reports. Comparative analysis may not contain the detailed data necessary for effective policymaking. International indices such as the Network Readiness Index and e-Government Development Index rate the digitization of Armenia's state system as an average indicator. Although this classification recognizes the importance of initiatives and measures already implemented, it also points to significant room for improvement. Government initiatives are at a good level, but efforts towards broader digitalization are just beginning to emerge. There is an urgent need to take clear and concrete steps towards a comprehensive digital transformation. Barriers to digital transition persist, especially in rural areas, due to underdeveloped infrastructure and lack of adequate digital skills among the population. Outside of urban centers, the quality and availability of online services remain limited, preventing the full realization of the benefits of digital governance continuous education programs aimed at increasing the digital capacity of both civil servants and citizens are needed. In addition, developing a centralized data management system based on international standards for data collection, storage, and exchange is of critical administrative importance. Another serious issue is the lack of a comprehensive digital ecosystem, which is vital for effectively implementing digital transformation processes. The creation of effective and functional platforms for promoting innovation and digitization is necessary to facilitate the sharing of resources, expertise, and best practices, accelerating progress in creating a fully digitized public administration system. Solving the identified problems requires a multifaceted approach, including strategic investments, the creation of a favorable digital ecosystem, and effective coordination between the public and private sectors. By implementing comprehensive and systemic solutions, Armenia can improve its digital infrastructure, as well as public services, and become more competitive internationally.

References

- Alcácer, V., & Cruz-Machado, V. (2019). Scanning the Industry 4.0: A literature review on technologies for manufacturing systems. *Engineering Science and Technology, an International Journal, 22*(3), 899–919. https://doi.org/10.1016/j.jestch.2019.01.006
- 2. AM-CERT. National CERT/CSIRT Armenia, Retrieved August 15, 2024, from https://am-cert.am/
- Bharadwaj A., El Sawy O.A., Pavlou P.A., & Venkatraman N. (2013). Digital Business Strategy: Toward a Next Generation of Insights, *MIS Quarterly*, 37(2), 471-482.
- Bannister, F., & Connolly, R. (2012). Defining e-governance. e-Service Journal, 8(2), 3–25.
- Banga, K. (2020). Can the digital economy help mitigate the economic losses from COVID-19 in Kenya? Overseas Development Institute. <u>https://set.odi.org/wp-content/uploads</u> /2020/05/Can-the-digital-economy-help-mitigate-the-economiclosses-from-COVID-19-in-Kenya.pdf
- Besada, H. (2018). Digital economy and the implementation of the 2030 agenda for sustainable development. United Nations Office for South-South Cooperation.
- Bukht, R., & Heeks, R. (2017). Defining, conceptualising and measuring the digital economy (Development Informatics Working Paper No. 68). Centre for Development Informatics, University of Manchester. <u>https://diodeweb.files.wordpress.com</u> /2017/08/diwkpaper68-digital_economy.pdf
- 8. Collis, A., & Brynjolfsson, E. (2019). How should we measure the digital economy? *Harvard Business Review*, 97(6), 140–149.
- Charalabidis, Y., & Lachana, Z. (2020). Towards a science base for digital governance. In The 21st Annual International Conference on Digital Government Research (dg.o 2020), June 15–19, 2020, Seoul, Republic of Korea (7 p). ACM.
- 10. Deloitte Insights. (2018). The Industry 4.0 paradox: Overcoming disconnects on the path to digital transformation. Deloitte. <u>https://www2.deloitte.com/content/dam/Deloitte/mx/Documents/e nergy-resources/2018/Industry-4dot0-Paradox-Overcoming-disconnects-on-the-path-to-digital-transformation.pdf</u>
- 11. Dutta, S., & Lanvin, B. (2023). The network readiness index 2023. Portulans Institute.
- https://download.networkreadinessindex.org/reports/nri_2023.pdf 12. e-Estonia Briefing Centre. (n.d.). Official website. Retrieved
- August 15, 2024, from <u>https://e-estonia.com/</u>
- Government of Armenia. (2023). Draft law on cybersecurity of the Republic of Armenia. Retrieved August 15, 2024, from <u>https://www.e-draft.am/projects/6656/about</u>
- Gribanov, Y. (2019). Digital transformation of socio-economic systems based on the development of the service integration institute [Doctoral dissertation, Saint Petersburg State University of Economics].
- Lumineau F., Wang W., Schilke O., Blockchain Governance–A New Way of Organizing Collaborations? *Organization Science*, 32(2) (2021), pp. 500-521

- 16. Hannibal, M., & Knight, G. (2018). Additive manufacturing and the global factory: Disruptive technologies and the location of international business. *International Business Review*, 27(6), 1116–1127. <u>https://doi.org/10.1016/j.ibusrev.2018.04.003</u>
- 17. International Telecommunication Union. (2024). Global cybersecurity index 2023. <u>https://www.itu.int/dms_pub/itu-d/opb/hdb/d-hdb-gci.01-2024-pdf-e.pdf</u>
- 18. Jiang, X. (2020). Digital economy in the post-pandemic era. Journal of Chinese Economic and Business Studies, 18(4), 333–339. https://doi.org/10.1080/14765284.2020.1855066
- Misuraca, G. C., & Viscusi, G. (2014). Digital governance in the public sector: Challenging the policy-maker's innovation Dilemma. In 8th International Conference on Theory and Practice of Electronic Governance (ICEGOV 2014) (pp. 146–154). ACM.
- 20. Minasyan, A., Shahbazyan, L., & Sanamyan, A. (2022). Challenges and prospects of digital economy development in the Republic of Armenia. *Messenger of ASUE*, *3*, 181–197. <u>https://asue.am/upload/files/science/banber/2022-year-3/10.pdf</u>
- 21. Queiroz, M. M., Wamba, S. F., Machado, M. C., & Telles, R. (2020). Smart production systems drivers for business process management improvement: An integrative framework. *Business Process Management Journal*, 26(5), 1075–1092. <u>https://doi.org/10.1108/BPMJ-03-2019-0134</u>
- 22. Shpak, N., Kuzmin, O., Dvulit, Z., Onysenko, T., & Sroka, W. (2020). Digitalization of the marketing activities of enterprises: Case study. *Information*, 11(2), Article 109. https://doi.org/10.3390/info11020109
- 23. Surfshark. (2023). Digital quality of life index 2023. Retrieved August 15, 2024, from <u>https://surfshark.com/dql2023?table=t</u>rue&country1=AM
- 24. Tapscott, D. (1995). The digital economy: Promise and peril in the age of networked intelligence. McGraw-Hill.
- 25. United Nations Department of Economic and Social Affairs. (2024). E-government survey 2024: Accelerating digital transformation for sustainable development. United Nations. <u>https://desapublications.un.org/sites/default/files/publications/2024</u> <u>-09/(Web%20version)%20E-Government%20Survey%202024%</u> 201392024.pdf
- 26. The World Bank. (2024). GovTech maturity index: The state of public sector digital transformation. International Bank for Reconstruction and Development. <u>https://openknowledge.worldbank.org/server/api/core/bitstreams</u> /5e157ee3-e97a-5e42-bfc0-f1416f3de4de/content
- 27. Velinov, E., Maly, M., Petrenko, Y., Denisov, I., & Vassilev, V. (2020). The role of top management team digitalization and firm internationalization for sustainable business. *Sustainability*, *12*(22), Article 9370. <u>https://doi.org/10.3390/su12229370</u>