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Integration of Digitization Opportunities in the Management of Public Institutions from Romania

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Abstract

This article presents the results of a research carried out on how to integrate the results of research on digitization in the management process of public institutions in Romania. The results of the survey based on the questionnaire showed that the tools specific to digitization that will be used most frequently in the future for a better exercise of the management functions of public institutions are cloud-based data management software products; Internet and Internet of Things (IoT); wireless networks; 5G networks; data analysis and visualization tools (Google Data Studio, QlikView, etc.); digital twin; social media, virtual reality.

Most of the respondents of the survey based on the questionnaire considered that the most important effect of the integration of digitalization opportunities on the improvement of the management process is the one that refers to the decision-making component of the management system, respectively to the faster fruition of opportunities through the decisions adopted by managers. In second place in the respondents' assessments were placed: the higher degree of substantiation of decisions and the increase in management efficiency as a result of the integration of digitalization opportunities on the improvement of the management process.

Other effects are those related to the amplification of management effectiveness and the reduction of the number of hierarchical levels (ensuring the proximity of management to execution). The effects of the future integration of digitization opportunities in the improvement of management processes in public institutions are higher on the decision-making component of the management system than on its organizational component.

Keywords: digitalization, management, public, institutions

Jel codes: IOO, M21



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1. Introduction

Digitalization in public institutions is the process of transforming the way public services are delivered and managed by using digital technologies. Digitalization can improve the efficiency, effectiveness, transparency and accountability of public institutions, as well as enhance the quality and accessibility of public services for citizens and businesses. Digitalization can also foster innovation, collaboration and participation in the public sector, as well as support the personalized, responsive and user-friendly services. Digitalization can also increase the trust and confidence of users in public institutions by ensuring data security, privacy and protection, as well as enabling greater transparency and accountability. development of digital skills and competencies among public employees and users.

Digitalization can increase the accessibility and availability of public services for all segments of society, especially for those who are marginalized, disadvantaged or vulnerable. Digitalization can also promote social inclusion and cohesion by facilitating communication, collaboration and participation among different stakeholders, such as citizens, businesses, civil society and other public institutions.

Digitalization can foster innovation and creativity in the public sector by creating new opportunities, challenges and solutions for public service delivery and management. Digitalization can also support the growth and competitiveness of the economy by enhancing the digital skills and competencies of the workforce, as well as creating new markets, products and services.

The digitization of public institutions also has implications for their management. Considering the evolution trends regarding the digitization of public institutions and the results published so far in the specialized literature, the research presented in this article had the following objectives:

- the study of how digitalization opportunities can be integrated into the management of public institutions in Romania;
- the analysis of the way in which the opportunities of digitization, especially those of a technological nature, are reflected in the perception of the subjects regarding the way of exercising management functions;
- analysis of the effects that the integration of digitization opportunities will have on the management of public organizations in Romania.

The research carried out, taking into account the evolution of the previous results presented in the specialized literature dedicated to the field of digitization of public institutions, sought to answer the following research questions:

- What is the state of knowledge in the digitalization of public institutions and their management?
- What are the digitalization opportunities that can be best integrated into the exercise of management functions?
- What will be the effects of the integration of digitization opportunities on the exercise of management functions?

The results of the research showed that digitization has important implications both on the exercise of management functions by the managers of public institutions in the perception of the survey respondents based on the questionnaire. Also, the conducted research revealed the fact that, in the respondents' perception, there will be broad effects on the management of public institutions.

2. Literature Review

The issue of digitalization opportunities from the perspective of public institutions and their integration in the management of organizations from the public system of specialized literature has been intensively studied and has a corresponding reflection in the specialized literature. From the perspective of the relations between the digitization process and public institutions, we consider that previous studies target six types of opportunities: political, economic, social, technological, legal and ecological.

From the perspective of political opportunities, the digitization of public institutions is mainly favored by ensuring an appropriate relationship between the respect of human rights and public safety (Pūraitė et al. , 2020), the amplification of the transparency of the governing act and specific policies based on open data (Behr, Oertzen & Dienst , 2021) and the development of the concept of Smart Government (Arief & Sensuse, 2018). Economic growth and economic development are mentioned mainly by Androniceanu and Georgescu (2023) but also by Sohag et al. (2021) as economic opportunities of the digitization of organizations and especially those in the public domain.

The unification of real and virtual social spaces (Laužikas, & Miliūtė, 2020) and the transition to a new digital paradigm affects all social spheres, given the degree of concentration of economic, political, social, informational and other resources in cities (Tabolin et al., 2021). It can be observed from the perspective of the previously cited studies the dynamics and extent of the digitization phenomenon, with obvious impact on all spheres of economic and social life.

From the perspective of digitalization opportunities and their impact on public institutions and their management, the most important are, according to the analyzes carried out and published so far, the opportunities of a technological nature, embodied in digital tools and technologies. Among the opportunities of a technological nature, embodied in digital tools and technologies, the most frequently mentioned in the specialized literature are: big data (Escobar et al., 2022), artificial intelligence (Nissim & Simon, 2021), drones (Vanderhorst et al., 2021), virtual platforms (Appolloni et al., 2021); Guzzo et al., 2023; Voda et al., 2022); robots (Vanderhorst et al., 2021); 3 D Printing/ 3D Streaming (Achille et al., 2019), cybersecurity (Willing, 2020), mobile applications (Ajouz, Abuamria & Hammad, 2021). And these are only relatively few in the set of technological opportunities of digitization from the perspective of public institutions.

From a managerial point of view, previous studies reveal a diversity of implications of the digitization process at the organizational level:

- Real-time planning and control of operations (Buer, et al., 2020; Ruiz Zuniga, et al., 2017);
- Increasing flexibility (Yildirim & Demirbağ, 2020);
- Increasing productivity (Yildirim & Demirbağ, 2020);
- The transition from the verticalization of the organization to the horizontal one, based on teams and networks (Vasilenko et al., 2022);
- Virtualization of communication (Vasilenko et al., 2022) and therefore implicitly of the coordination function.

In the field of public administration and public management, the results of previous studies seem to indicate that digitization contributes to the amplification of citizens' participation in public decision-making and implicitly to the proliferation of E-government (Vasilenko et al., 2022; Behr, Oertzen & Dienst, 2021). Digitization contributes to the initiation and implementation of new rounds of administrative reforms acting in line with New Public Management and New Value Management. Vasilenko et al. (2022) consider that digitization contributes to the creation of special performance mechanisms for the exercise of management functions.

3. Data & Methodology

To carry out the research, a survey based on an online questionnaire (made with Google Forms) addressed to the subjects (managers and executors) from public institutions was used. Given the relatively short time and resources available, the "snowball" technique was used, a non-probability sampling technique used in research to identify and select participants who are, in turn, able to provide information or participate in the study. The questionnaire had three main sections: one intended for general data regarding the particularities of the respondents and the organizations in which they work; one that aims at the relationship between digitalization and the exercise of management functions (on the whole of the three phases of the management process) and the third section that considers the effects of digitalization on the management of public institutions. For each item, a Likert scale from 1 to 5 was used indicating from total agreement/use to a great extent to total disagreement or no use of digital tools.

Thus, the following areas in which public institutions operate were targeted: internal affairs; finance; transport and infrastructure; justice; national defense; education; culture; foreign affairs; economy, entrepreneurship and tourism; European investments and projects; development, public works and administration; health; agriculture and rural development; energy; research, innovation and digitalisation; environment, waters and forests; youth and equal opportunities; other areas apart from those previously presented.

377 managers and executives from public institutions in Romania responded to the questionnaire applied between July and September, a representative sample both from the perspective of the number of employees in public institutions and their typology. Considering the sampling technique used, not all fields of activity had the same representativeness. Processing the results took into account the average of the responses for each item considered.

4. Results

A first topic on which the respondents were questioned was the extent to which the improvement of the forecasting function and implicitly the forecasting phase of the management process will be influenced in the future by the use of tools specific to the digitization of organizations in the public domain. The results of the questionnaire survey regarding the contribution of digitization tools to the improvement of the management process are presented in the following figure.

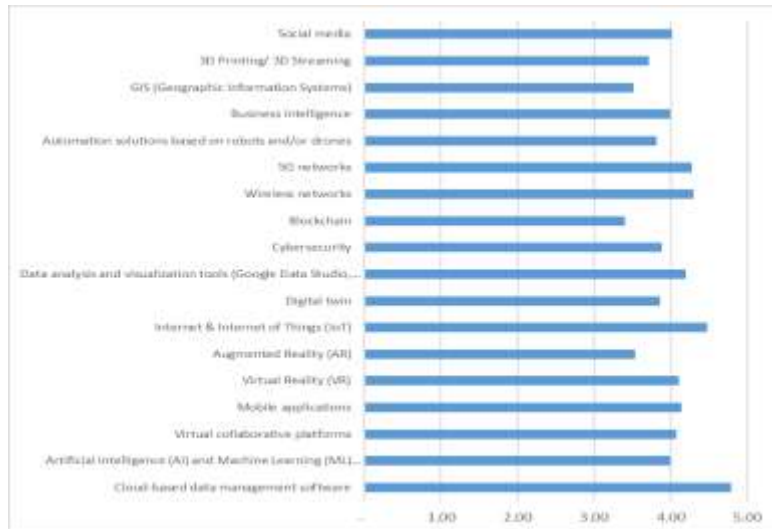


Figure 1. Future use of digitization tools for better planning of activities in public institutions

Source: own processing of survey data based on a questionnaire

The respondents of the questionnaire considered that the digitalization-specific tools that will be used most frequently in the future for a better planning of activities in public institutions are: cloud-based data management software; Internet and Internet of Things (IoT); wireless networks; 5G networks; data analysis and visualization tools (Google Data Studio, QlikView, etc.). According to respondents, the least used tools in the future for better planning of activities in public institutions will be: blockchain, GIS, augmented reality and 3D printing. Analyzing the responses of those surveyed, it is observed that artificial intelligence (AI) and machine learning (ML) are not among the most frequently used in the future to improve the planning of activities in public institutions, a surprising fact considering the applications of these tools in the creation of models of forecast.

Another element on which the respondents were questioned was the extent to which the improvement of the organizational function and the organizational subsystem will be influenced in the future by the use of tools specific to the digitization of organizations in the public domain. The results of the survey based on the questionnaire regarding the contribution of digitization tools to the improvement of the organization within public institutions are presented in the following figure.

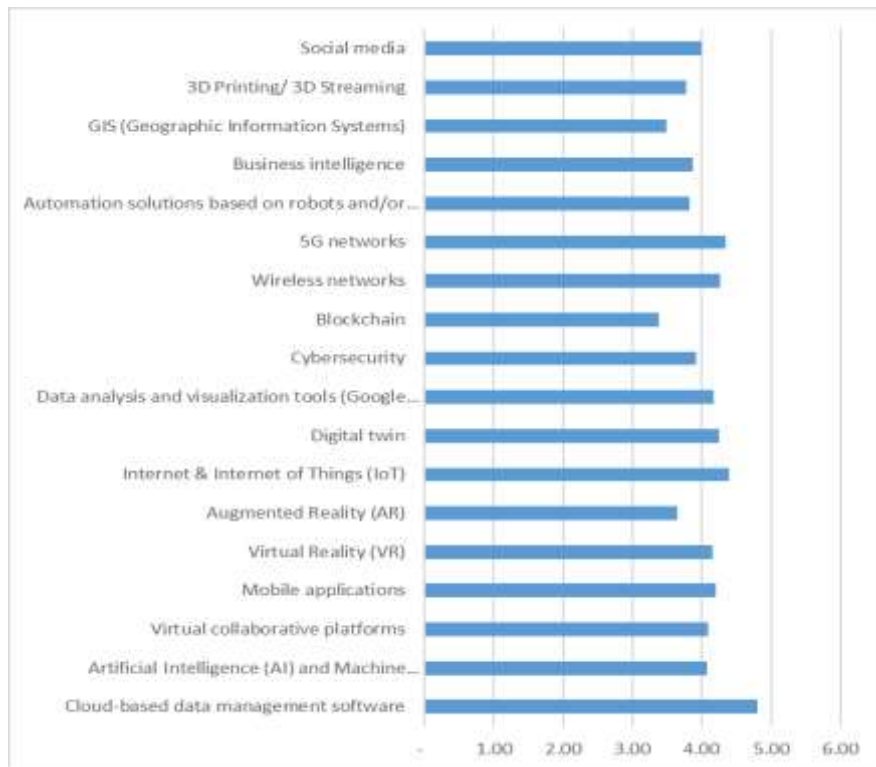


Figure 2. The future use of digitization tools to improve the organization of public institutions

Source: own processing of survey data based on a questionnaire

The respondents of the questionnaire appreciated that the digitalization-specific tools that will be used most frequently in the future to improve the organization of public institutions are: cloud-based data management software; Internet and Internet of Things (IoT); 5G networks; wireless networks; data analysis and visualization tools (Google Data Studio, QlikView, etc.); digital twin. According to the respondents, the least used tools for organization in public institutions will be in the future: blockchain, GIS, augmented reality, automation solutions based on robots and/or drones and 3D printing. As in the case of planning, it is observed that artificial intelligence (AI), machine learning (ML), virtual platforms are not among the most frequently used in the future to improve the organization in public institutions.

The respondents were also questioned on the specific digitalization tools that can be used in the future to improve staff coordination and communication in the institutions where they work. The results of the questionnaire-based survey regarding the contribution of digitization tools to improving coordination within public institutions are presented in the following figure.

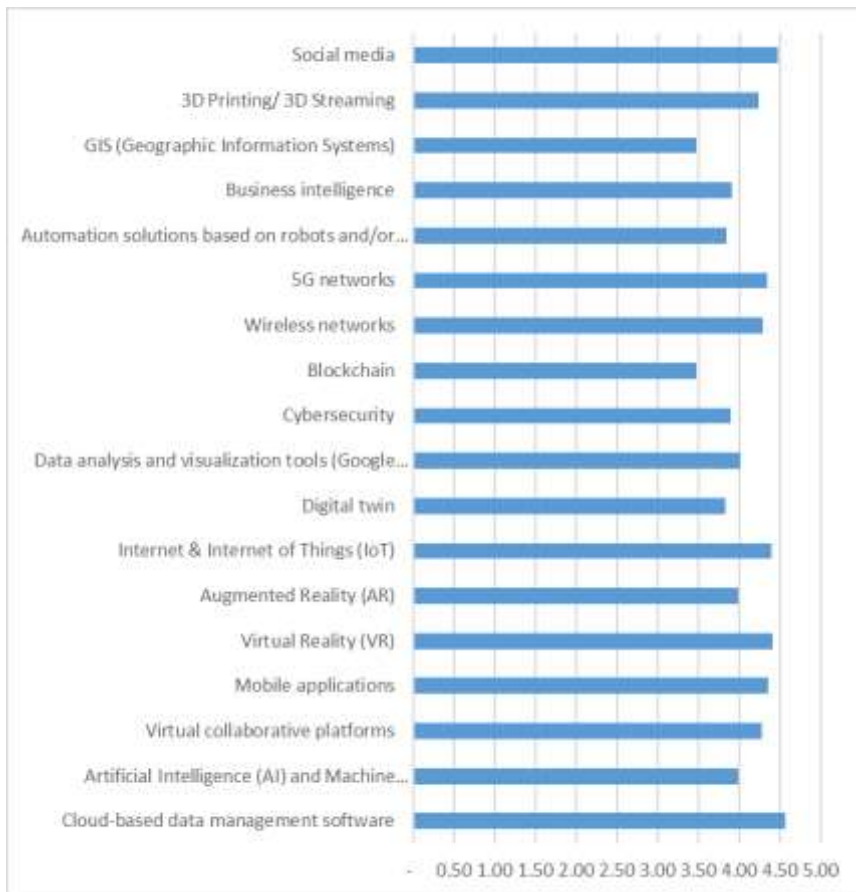


Figure 3. The future use of digitization tools to improve the coordination of public institutions

Source: own processing of survey data based on a questionnaire

In the perception of the respondents of the questionnaire, the most used tools of digitalization to improve staff coordination and communication in public institutions will be cloud-based data management software, social media, virtual reality, the Internet and the Internet of Things (IoT), mobile applications and 5G networks . It is noted that tools that are frequently used for communication today, such as social media, are expected to be used in the future for the coordination of staff in public institutions. Other tools will be added to them, such as virtual reality, but also some to which the respondents gave less importance, such as augmented reality.

The extent to which digitization-specific tools will be used in the future to improve control in the institutions where respondents work was another area targeted by the questionnaire-based research. The synthesis of the answers regarding the contribution of digitization tools to the improvement of control within public institutions is represented in the following figure.

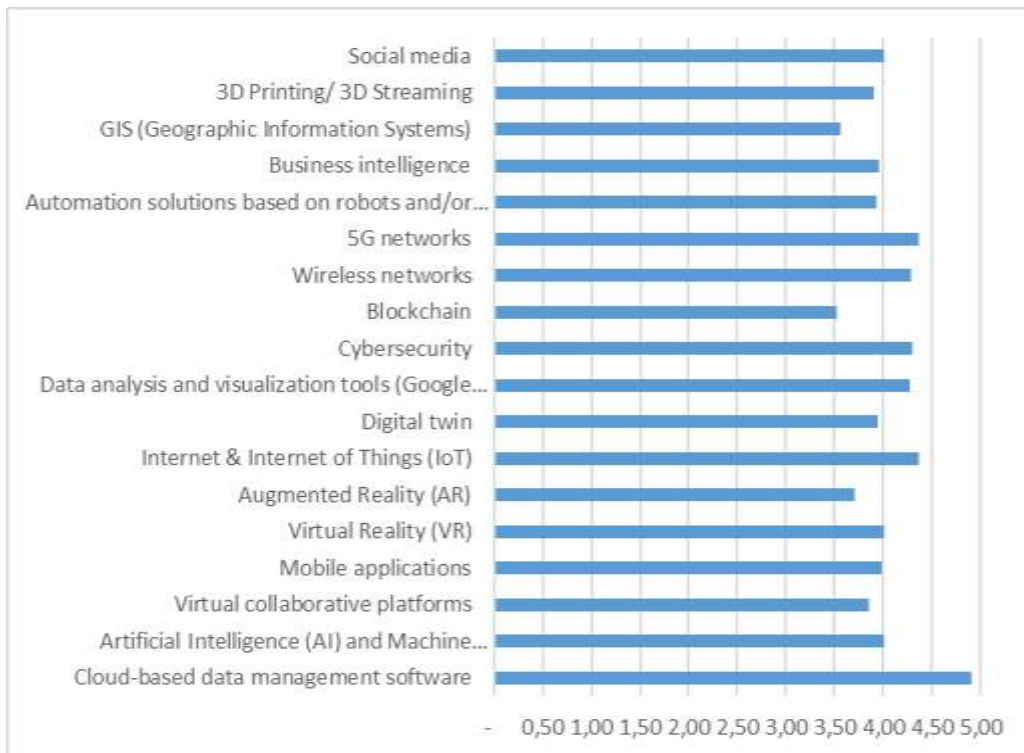


Figure 4. The future use of digitization tools to improve the control of public institutions

Source: own processing of survey data based on a questionnaire

According to the opinions expressed by the respondents, the tools that will contribute the most in the future to the improvement of control in public institutions are cloud-based data management software products, cybersecurity, data analysis and visualization tools (Google Data Studio, QlikView, etc. .), wireless and 5G networks. The least used tools in the future for improving control within public sector organizations are GIS and blockchain.

The expected effects of the integration of digitization opportunities on the improvement of management processes were analyzed from the perspective of the following elements of the management system of public institutions: the decisional subsystem (taking into account two of the rationality requirements of decisions); the organizational subsystem (through the lens of the principle of the approach of management to execution) and the requirements of effectiveness/efficiency of management at the organizational level. The summary (means) of the responses of the surveyed subjects is presented in the following figure.



Figure 4. Expected effects of the integration of digitization opportunities on the improvement of management processes

Source: own processing of survey data based on a questionnaire

As can be seen from the previous figure, many of the survey respondents based on a questionnaire considered that the most important effect of the integration of digitization opportunities on the improvement of the management process is the one that refers to the decision-making component of the management system, respectively to faster fruition of opportunities through decisions made by managers. In the second place in the respondents' assessments was also placed a requirement for rationality of managerial decisions, namely the fact

that the integration of digitalization opportunities in the improvement of management processes will ensure a higher degree of substantiation of decisions in the future. Also in second place in the respondents' assessments was the increase in management efficiency as a result of the integration of digitalization opportunities on the improvement of the management process.

Other effects of the integration of digitization opportunities on the improvement of the management process, with environments close to those of the second place, are those related to the amplification of management effectiveness and the reduction of the number of hierarchical levels (ensuring the proximity of management to execution). It is observed that, taking into account all the surveyed subjects, the effects of the integration of digitization opportunities in the improvement of management processes in public institutions are higher on the decision-making component of the management system than on its organizational component.

5. Conclusions

This article presents the results of the research on the integration of digitization opportunities in the management of public institutions in Romania following a survey based on a questionnaire addressed to both managers and executors in these organizations. From a managerial perspective, the questionnaire had three sections, two of which were focused on the use of technological opportunities in the exercise of management functions (aiming at the management process as a whole) and on the effects on the management process in public institutions.

The obtained results showed that, in the opinion of the questionnaire respondents, technological opportunities can play an important role in improving the management process in public institutions in Romania, in all its phases. At the level of each managerial function, in the view of the respondents of the questionnaire, digitalization tools can have different contributions. Cloud-based data management software; Internet and Internet of Things (IoT); wireless networks; 5G networks; data analysis and visualization tools are more used to improve planning in public institutions, while social media or virtual reality are more present in improving the coordination function.

The most important effects of digitalization from the perspective of the management system aim at its decision-making component, in the sense of increasing the degree of substantiation of decisions as well as their opportunity. An important contribution of digitalization aims at the overall efficiency and effectiveness of the management system of Romanian organizations in the public domain. Since these are the finality of any management process, we can conclude that, in the opinion of the consulted Romanian specialists, the digitalization of public institutions, the integration of digitalization opportunities in the exercise of management functions.

References

- Achille, C., Tommasi, C., Rechichi, F., Fassi, F., & De Filippis, E. (2019). Towards an advanced conservation strategy: A structured database for sharing 3D documentation between expert users. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 42, 9-16.
- Ajouz, M., Abuamria, F., & Hammad, J. (2021). Factors Influencing Mobile Payment Adoption and Its Role in Promoting Financial Inclusion: An Integrated Reflective Model with Theory of Planned Behavior. In *International Conference on Business and Technology*, 563-581. Cham: Springer International Publishing.
- Androniceanu, A., & Georgescu, I. (2021). E-Government in European countries, a comparative approach using the Principal Components Analysis. Network of Institutes and Schools of Public Administration in Central and Eastern Europe. *The NISPAcee Journal of Public Administration and Policy*, 14(2), 65-86.
- Appolloni, A., Colasanti, N., Fantauzzi, C., Fiorani, G., Frondizi, R. (2021) Distance Learning as a Resilience Strategy during Covid-19: An Analysis of the Italian Context. *Sustainability*, 13, 1388. <https://doi.org/10.3390/su13031388>
- Arief, A., & Senses, D. I. (2018). Designing A Conceptual Model for Smart Government in Indonesia using Delphi 2 nd Round Validity. In 2018 International Conference on Advanced Computer Science and Information Systems (ICACSIS), 93-98.
- Behr, F., Oertzen, G., Dienst, M. (2021) Managing Sustainability and Carbon-Neutrality in the Public Administration—Case Report of a German State Institution. *Sustainability*, 13, 4146. <https://doi.org/10.3390/su13084146>
- Buer, S. V., Strandhagen, J. W., Semini, M., Strandhagen, J. O., (2020), “The digitalization of manufacturing: investigating the impact of production environment and company size”, *Journal of Manufacturing Technology Management*, vol. 32, no. 3, pp. 621-645.
- Escobar Borja, M., Mercado Pérez, M., & Rodríguez Luna, R. (2020). Beneficios ofrecidos por la gestión del Big Data en las instituciones gubernamentales en la era de la digitalización (Benefits Offered by the Management of Big Data in Government Institutions in the Digitalization). *La Propiedad Inmaterial*, (30).

- Guzzo, T., Caschera, M. C., Ferri, F., & Grifoni, P. (2023). Analysis of the Digital Educational Scenario in Italian High Schools during the Pandemic: Challenges and Emerging Tools. *Sustainability*, 15(2), 1426.
- Iolanda Voda, A., Florea, N., Ciulu, R., Luiza Costuleanu, C., & Gradinaru, C. (2022). Digital strategy assessment in education. what actions need to be addressed? The perception of students in social sciences and humanities. *Transformations in Business & Economics*, 21.
- Laužikas, M., & Miliūtė, A. (2020). Impacts of modern technologies on sustainable communication of civil service organizations. *Entrepreneurship and sustainability issues*, 7, 2494-2509.
- Nissim, G., & Simon, T. (2021). The future of labor unions in the age of automation and at the dawn of AI. *Technology in Society*, 67, 101732.
- Pūraitė, A. ., Adamonienė, R. ., & Žemeckė, A. . (2020). Sustainable Digitalization in Public Institutions: Challenges for Human Rights. *European Journal of Sustainable Development*, 9(3), 91. <https://doi.org/10.14207/ejsd.2020.v9n3p91>
- Ruiz Zuniga, E., Syberfeldt, A., Urenda Moris, M., (2017), “The Internet of Things, Factory of Things and Industry 4.0 in Manufacturing: Current and Future Implementations”, *Advances in Manufacturing Technology Xxxi*, vol. 6, pp. 221-226.
- Sohag, K., Shams, S. R., Darusalam, D., & Devalle, A. (2021). Information digitalisation and local institutional agility: evidence from ASEAN countries. *Technological Forecasting and Social Change*, 172, 121063.
- Tabolin, V. V., Pitryuk, A. V., & Abbasov, I. M. O. (2021). City: Legal and Urbanological Factors of Digitalization. In *Socio-economic Systems: Paradigms for the Future* (pp. 1721-1728). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-56433-9_178
- Vanderhorst, H. R., Suresh, S., Renukappa, S., & Heesom, D. (2021). Strategic framework of Unmanned Aerial Systems integration in the disaster management public organisations of the Dominican Republic. *International Journal of Disaster Risk Reduction*, 56, 102088.
- Vasilenko, L., Meshcheryakova, N., & Zotov, V. (2022). Digitalization of Global Society: From the Emerging Social Reality to its Sociological Conceptualisation. *Wisdom*, 21(1), 123–129. <https://doi.org/10.24231/wisdom.v21i1.720>.
- Willing, M., Dresen, C., Haverkamp, U., & Schinzel, S. (2020). Analyzing medical device connectivity and its effect on cyber security in german hospitals. *BMC medical informatics and decision making*, 20(1), 1-15.