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Public Administration in the Context of Digital Transformation: Innovations and Challenges

Lina STOROZHENKO[1], Oleksandr OLSHANSKYI[2], Nataliia STATIVKA[3], Alina CHERNOIVANENKO[4], Yevheniia HORDIIENKO[5]

Abstract

The processes of the management system transformation in various spheres of socio-economic relations towards the growth of the role of publicity, information accessibility, and digitalization of management algorithms are among the current global trends. The study aims to provide a comprehensive analysis of the aspects of public administration mechanism implementation in the context of digital transformation. The research identifies the main issues of the management paradigm and options for its solution. The study was carried out based on general scientific methods of cognition. They include logical and structural analysis, comparison, theoretical modeling, abstraction, induction, and deduction, as well as statistical methods, specification, generalization, and formalization. The article explores the innovative aspects of public administration in the context of global

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digital transformation. The authors have considered the public administration digitalization process's main issues, challenges, and achievements. It has been determined that the effective use of digital transformation opportunities is an essential prerequisite for intensifying the effectiveness of economic processes. Moreover, the authors developed a universal model of effective digitalization of the public administration system. Furthermore, the practical significance of the research findings is seen in the possibility of their application during the development of relevant programs. The latter aims to improve the efficiency of the public administration system, increase the productivity of various spheres of socio-economic activity, and form a versatile, effective model of digital optimization of management processes in the context of sustainable development.

Keywords: digitalization; automation of processes; optimization; administration; strategic management; netocracy; netocratic public administration; digital transformation.

Introduction

The intensification of globalization and integration processes is giving rise to new challenges. They require corresponding dynamic adaptations in the management system of socio-economic processes. The concept of digital transformation, fully implemented in the public administration system, is currently viewed as the most effective management trend. It aims to ensure the balance of various spheres of society's development and provides for the development of a set of organizational foundations, as well as practical means of implementation and monitoring. Altogether, they aim to optimize socio-economic life processes. This concept guarantees the optimization and simplification of management processes, as well as the synergistic development of various spheres of societal life.

The issues of public management in the context of digital transformation are considered by Ukrainian and foreign researchers from various scientific fields, including political science, sociology, and administrative law (Volska, 2020; Esposito & Dicorato, 2020). Some studies by contemporary scholars are devoted to the analysis of how public administration mechanisms function in the context of global digitalization. They include practical research on their implementation (Funk & Karlsson, 2020: 355). Other researchers consider the concept of public administration digitalization from the standpoint of the complexity and difficulty of this issue (Bisongo, 2023; Meuleman, 2021).

Examining the essence of digital transformation in public management, scholars break it down into specific directions, including the goal, means, and communication among process participants (Chen, Walker & Sawhney, 2020: 1674). At the same time, they emphasize that the potential and opportunities of

digitizing public administration processes fully unfold based on the harmonization of key factors. They include social, economic, and ecological factors. The latter forms the basis of the sustainable development concept (Lewallen, 2021: 1035).

The results of current research by modern scholars convincingly show that digitalization is primarily the effective use of information to formulate optimal solutions and create the preconditions for their implementation (Guarini, Mori & Zuffada, 2021).

The general issues of public administration in the context of sustainable development have been thoroughly studied in the studies conducted by contemporary scholars (Krafft, Zweig & König, 2022: 122; Klenk & Reiter, 2019: 7). Specific conceptual issues are reflected in the works of particular researchers (Kankanhalli, Charalabidis & Mellouli, 2019: 307). However, despite the scientific value of the published studies, many issues remain unresolved. The problems related to the analysis of the algorithm for the successful implementation of modern opportunities for public administration digital optimization in the context of global challenges and modern crises are currently under-researched and require further scientific consideration.

This study aims to analyze the innovative possibilities of digital optimization of public management in the conditions of sustainable development and the dynamics of conceptual priorities in the present crises.

Literature review

The scientific and methodological framework for the study was laid by researchers focused on aspects of implementing the principles of public administration in the context of sustainable development, the problems of digital transformation of management processes, and finding ways to solve them.

There are numerous publications in scientific professional journals on the topics covered by this paper. Some elements of public administration mechanisms in the context of digital transformation are considered in the studies of modern scholars (Rusch, 2023: 1165; Armenia, Casalino, Gnan & Flamini, 2021). Among the current publications, it is worth highlighting the works by Kraus, Durst, Ferreira, Veiga & Weinmann (2022). They fundamentally substantiate the principles of effective implementation of public administration in the context of modern global digitalization processes. At the same time, some scholars (Nadkarni & Prügl, 2021: 238) emphasize the need for proper preventive measures to prepare society for the digitalization of administrative processes.

Modern scientists (Kostakis & Kargas, 2021) highlight the main conceptual principles of an effective public administration system based on digital optimization. Separate studies by leading scientists (Fernandez-Vidal, Perotti, Gonzalez & Gasco, 2022: 30) emphasize the need for active implementation of digitalization

and electronic document management in almost all areas of social and economic life. At the same time, scientists (Shandryk, Zhebelev, Deliatynchuk, Maksymov & Shelest, 2023) point out the complexity of introducing some aspects of public administration digitalization into modern society.

Thus, despite the significance of the scientific and practical achievements of scientists on the studied issues, it is necessary to outline the need to develop scientific research in the direction of digital transformation of public administration processes. This will ensure the sustainability of positive dynamics and preventive response to new challenges under global digitalization.

Methodology

During the study, a set of general scientific methods of cognition was applied, namely: (1) abstract-logical and comparative analysis; (2) abstraction; (3) induction and deduction methods; (4) methods of concretization and formalization; (5) tabular and graphical interpretation of theoretical information.

The theoretical and methodological basis of the paper was formed, taking into account the priority principles of conducting comprehensive research based on a systemic approach. The complexity principle allows analyzing the object and subject of study as a system with a corresponding set of relationships.

Analysis and synthesis methods were applied to identify the factors and stages of development of the researched object, as well as its defining elements. The method of comparison in the research process was used to determine the specificity of the development and features of public management models in the conditions of digital transformation. The deduction was applied in developing proposals for optimizing the algorithm of digitalization of management processes in various spheres of socio-economic life. The inductive method was used to predict indicators of prospective development.

Abstract-logical and dialectical methods of scientific cognition, as well as scientific abstraction, were used to form theoretical generalizations, refine the conceptual apparatus, highlight basic concepts and categories, draw conclusions from the research, and create the concept of the integral process of management system under sustainable development. The formalization method in the research process was applied at the stage of identifying priority vectors. This method helped to optimize the public management system on the principles of digital transformation, as well as in forming the results of scientific searches aimed at active, practical use in the digitization process of an effective public management system. Thus, with the help of this method, the structuring of the principles, functions, tasks, and priorities of public management under global digital transformation was carried out.

The general scientific method of concretization was applied to position the efficiency and expediency of enhancing the role of the toolkit of digital transformation of public management in the process of conducting socio-economic reforms. This method allowed us to identify optimal solutions and conditions for optimizing the public management system on the principles of sustainable development.

The author's contribution, which is positioned by this study, consists in the analytical justification of the conceptual vectors of the innovative approach of public administration in the conditions of digital transformation, as well as the risks accompanying its practical implementation.

Results

The era of modern administrative algorithms at all levels of socio-economic processes, along with the intensification of implementing sustainable development principles, requires an institutional transformation of the public administration system. The rapid diversification of existing management practices and large-scale technological and innovative development in the context of globalization led to the formation of the concept of the growing role of digitalization tools (Rêgo, Jayantilal & Ferreira, 2022: 3197). In many ways, public management is related to the following aspects: (1) planning, organization, and control of socio-economic processes; (2) introduction of modern information systems and digitalization tools; (3) effective human resource management and performance monitoring.

Currently, a systematic approach to the research topic is generally accepted. This approach identifies three main areas of public administration from the standpoint of sustainable development: (1) financial and economic development; (2) social transformation; (3) environmental safety guarantees.

At the same time, the formation of a new administrative system involves considering the existing potential, the top priority of guaranteeing decent conditions for society's life, given the changes, adaptability, and promising growth. It also includes the synergy of national priorities and interests of local communities regarding the goals and means of their development (He, Huang, Choi & Bilgihan, 2023: 150). The main opportunities offered by a practical public administration system for modern society include the following: (1) depoliticization; (2) prioritization of the interests of service consumers; (3) systematic quality monitoring and continuous improvement.

Separate attention should be paid to the partnership approach. It is posed by the public administration system, where the state and citizens are equal participants in the relationship (Kostakis & Kargas, 2021). The main tasks of digital optimization of public administration processes involve: (1) maximizing the use of modern digital tools; (2) improving the quality of interaction between participants in

socio-economic projects; (3) optimizing the management system; (4) increasing functional production capabilities (Nadkarni & Prügl, 2021: 235).

Notably, digital optimization is a continuous process inextricably linked to innovative technologies. It aims to meet market expectations and increase productivity and competitiveness (Rusch, 2023: 1162). The role of digital optimization in the public administration system cannot be overestimated, given the current situation. At the same time, it should be noted that such an effect can have different forms of expression. Moreover, it can be achieved by various methods and means (Esposito & Dicorato, 2020).

The analysis of the basic strategic foundations of digitalization in public administration, as observed in developed countries of the global community, forms a strong belief in the necessity of synergizing efforts in the aspect of actively implementing digitization tools simultaneously with ensuring the realization of security strategies in the digital space (Bisongo, 2023). It is important to note that currently, there is no standard algorithm for the mechanism of digital optimization of administrative processes. The spectrum of imperatives requires the effective implementation of the analytical component of the conceptual structure of the transformation algorithm. Analytical processes should become an effective prerequisite for the successful digitalization of the industry (Lewallen, 2021: 1045).
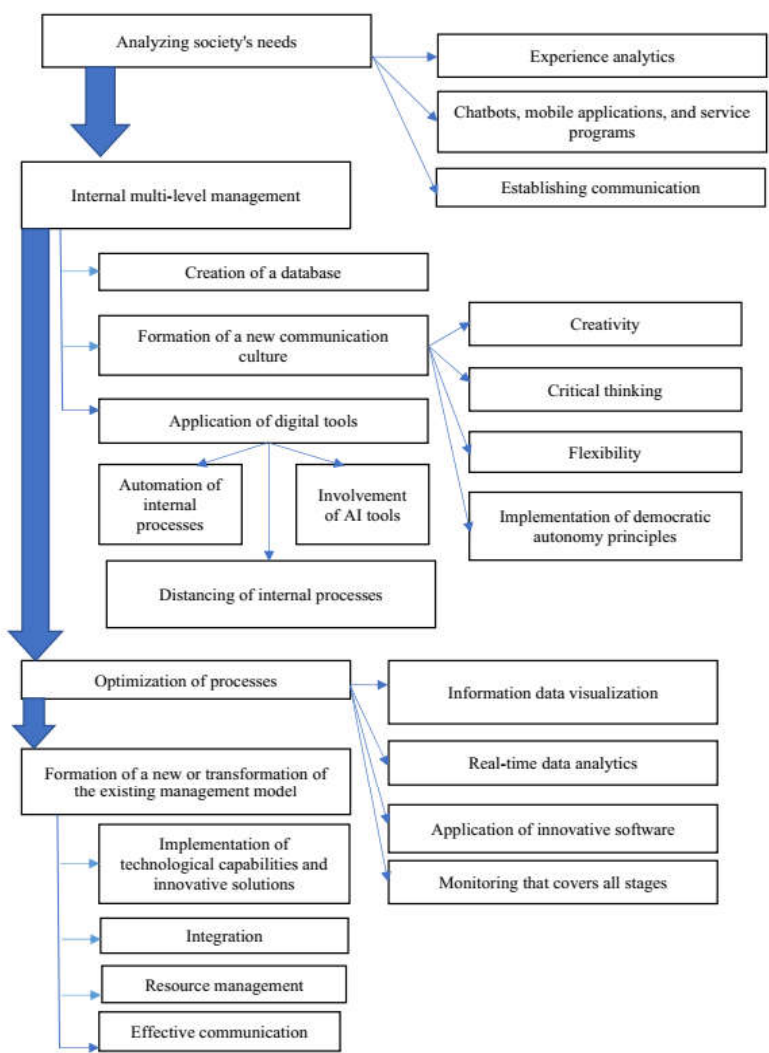
Based on the study of the theoretical principles of digitalization and the possibilities of their adaptation in the current realities, it seems advisable to form a concept of public administration. Such a concept has the following tasks: (1) to increase the efficiency and productivity of socio-economic processes; (2) to ensure production orientation to demand and current market needs; (3) to cultivate effective relationships between labor, financial, and information resources; (4) to stimulate the desire to improve production efficiency and obtain optimal results with minimization of costs.

It is worth noting that effective management implies flexibility, adaptability, and regular review of goals and programs depending on market conditions. In addition, an essential prerequisite for the successful digital optimization of the public management system is the use of modern, innovative technological and communication capabilities (Yermakov, Hrebennikova, Nahornyi & Chetveryk, 2019).

The prospects for developing digitalization in managerial processes should primarily be based on modeling the transformation processes in the entire set of influencing factors and interdependencies (Li, 2022: 30). Since any efficiency indicator is subject to the influence of various factors, it is vital to identify, forecast, and neutralize these factors if they are negative. The general structure of the digital optimization of the public administration system is reflected in Figure 1.

An essential issue in the process of public administration digital optimization is to guarantee transparency, reliability, and relevance of relevant data (El Khatib,
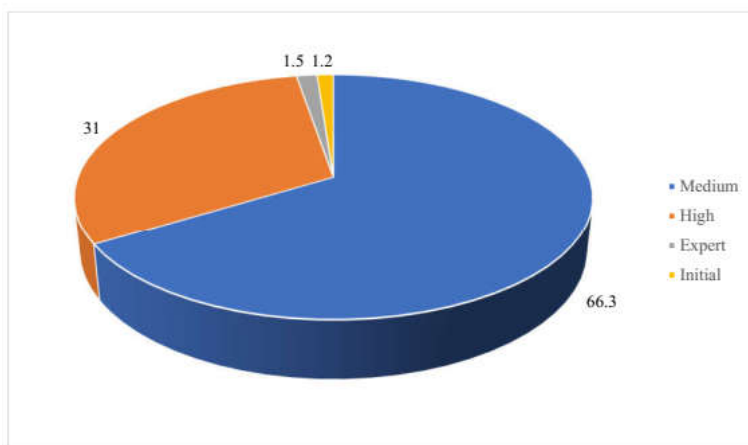
2022: 3). The current strategy of the public administration digitalization system at various levels should form some hub of interrelated organizational and information principles, tools, and levers that help increase the accessibility and relevance of data. At the same time, it should not contradict the current security and sustainable development principles. In this case, the main features of the system of effective digital optimization of the public administration system include flexibility, balance, systematicity, efficiency, and risk minimization (Kankanhalli, Charalabidis & Mellouli, 2019: 304).

Source: author's elaboration

Figure 1. Digital optimization of the public administration system

When analyzing foreign experience in the successful implementation of digital modernization of management processes, it is worth noting the most popular areas of digitalization. They include the use of artificial intelligence and digital marketing tools, namely chatbots, service programs, mobile applications, digital archives, and user behavior analysis (Guarini, Mori & Zuffada, 2021). The main benefits of actively using these measures will be the following: (1) personalization of user experience; (2) increased speed of information processing through interaction with chatbots; (3) optimization of search functionality; (4) analytics of large amounts of data and its statistical processing.

To date, the level of mastery of digitalization technologies actively used in the process of public administration leaves much to be desired. This is evidenced by the results of sociological research (Figure 2).
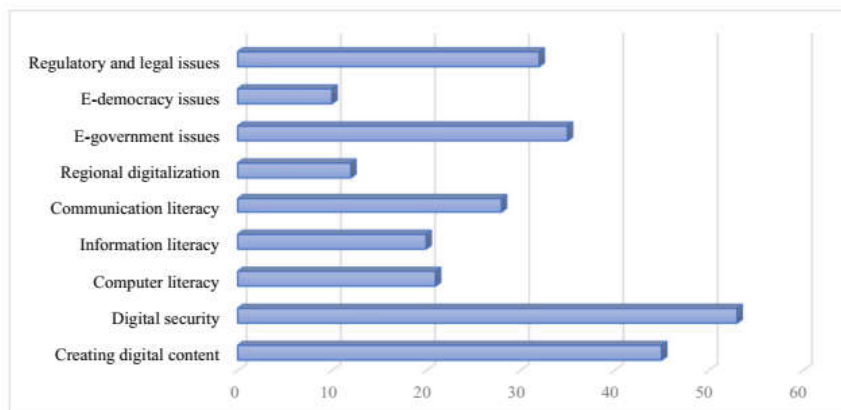

Source: author's development

Figure 2. Levels of digital competence of civil servants as of 2023

Analyzing the results of official research, it is worth noting that the majority of respondents have an average level of digital competence. Considering that the analysis was carried out in relation to employees of the highest management rank, this indicator is not satisfactory. The priority direction of optimization of public administration processes in the era of digitalization should be stimulation of increasing the level of digital awareness of employees.

At the same time, in the structure of problems on the way to mastering digital skills, the respondents noted, first of all, the issues of digital security and the creation of digital content (Figure 3).

Source: author's development

Figure 3. Vectors of the issues of digital transformation of public administration, %

Among other challenges accompanying the process of digital transformation of the public administration system, issues in the regulatory and legal field, communication literacy, and the issue of e-government were noted. High indicators were recorded in terms of general computer and information literacy, which is considered unacceptable in the public administration sector at today's level of digitization of all social processes. Such a situation requires urgent optimization.

The purpose of promising scientific research in this area should be identifying strategic priorities for forming a universal algorithm for the digitalization of public administration processes. In this case, an important role is given to attracting international practical experience, developing new methods, and improving existing ones within a comprehensive and innovative approach to the digitalization of the management system.

Discussions

The overwhelming majority of modern scholars see public administration as the basis for the innovative development of socioeconomic processes toward sustainable development. According to scientists of current scientific directions (Beverungen, Hess & Köster, 2022: 493), one of the most effective means for optimizing management processes is the active use of digitalization tools in the public administration system.

The digital transformation of the modern public management system implies, first and foremost, fundamental changes in the communication model. Modern scientists (He, Huang, Choi & Bilgihan, 2023: 147; Nahornyi, Tiurina, Ruban, Khletytska & Litvinov, 2022: 115) argue that the best option is to develop a product

for a specific category, needs, and consumption variation. However, it requires proper communication processes and the priority of long-term cooperation.

As evidenced by modern scientists (de Paula, Marx, Wolf, Dremel & Uebernickel, 2023: 42), the current stage of the digital transformation of the public management sphere has the following priorities: (1) abandoning outdated technologies and action algorithms; (2) resource processes' optimization; (3) establishing internal effective communication; (4) leveraging the opportunities of artificial intelligence technologies.

Scientists (Li, 2022: 32; Cagno, Neri, Negri, Bassani & Lampertico, 2021) believe that one of the most effective means of digitalization in the studied area is the use of functional chatbots, mobile applications, thematic blogs, and media products. At the same time, дослідники (López García & Lizcano, 2019) assure that visualization is the main trend in modern economic and information processes. It ensures the efficiency and versatility of the public administration system in various spheres of life. Innovative events in the field of public administration should be focused on modernizing the system of digital tools, increasing the accessibility, speed, and completeness of information, and expanding the scope of transformational changes (Trondal, 2021: 410; Marques, Leitão, Carvalho & Pereira, 2021).

Based on the findings of modern scientists (Zuiderwijk, Chen & Salem, 2021), it can be argued that digitalization has significantly expanded its scope of functioning today, becoming an essential element of the market system. The authors consider the digital optimization of management processes as a key prerequisite for the development of modern innovation. At the same time, scientists note that increasing the productivity of administrative procedures based on digitalization involves the gradual and effective achievement of goals (Vinuesa, Azizpour & Leite, 2020).

Based on the results obtained in this study and the conclusions of the authors mentioned above, we can predict an increase in the role of digital optimization tools in the implementation of a successful transformation of public administration policy. This approach will help to significantly increase the productivity of administrative decisions, introduce innovative management capabilities, and ensure compliance with the requirements of sustainable development.

Conclusions

The research analyzed the multifactorial nature of the public administration paradigm based on digital optimization. The authors assessed the role and place of digitalization in the system of socioeconomic transformations. During the study, it was found that the effective use of digitalization opportunities is an essential prerequisite for intensifying the effectiveness of management tools. The authors have identified the priority vectors of digital optimization of public administration

and proposed a universal algorithm for effective digitalization of activities in the field of public administration.

Based on the research outcomes, the authors proposed several measures to be applied within the framework of the general trend of digital optimization of the administrative sphere. A universal model of digital optimization has been developed. This model covers the most essential stages of digitalizing socioeconomic processes and management systems. The article outlines the principles of a mechanism for adapting the existing principles of public administration to the requirements of digitalization and substantiates the feasibility of transforming this area. The paper established that only the synergy of a professional approach, a stable position, and principles of forming strategic priorities for the transformation of socioeconomic processes, given global digitalization and the need for proper control by the State and society, allows to fully and quickly introduce an effective system of public administration in the digital transformation.

Following the results obtained in this study, the authors have proposed priority vectors for further research on the topic. Also, they have argued for the need to organize the availability and systematization of practical information on digital optimization of the public administration sphere.

A practical approach to the system of digital optimization of administrative processes involves a hub of methods and tools in a set of interconnections that can ensure an increase in the level of productivity and efficiency of communication and integration processes. It should be based on the implementation of a development strategy formed upon the principles of sustainable development as an integral part of the management paradigm.

Therefore, there is a need to explore further the possibilities of using digitalization tools. It is necessary to involve international practical experience to develop and implement optimal programs to improve the efficiency of public administration.

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