Problems of Applying Information Technologies in Public Governance

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Summary
The relevance of research provides the necessity to identify the basic problems in the public governance sphere and information technology relations, forasmuch as understanding such interconnections can indicate the consequences of the development and spreading information technologies. The purpose of the research is to outline the issues of applying information technologies in public governance sphere. 500 civil servants took part in the survey (Ukraine). A two-stage study was conducted in order to obtain practical results of the research. The first stage involved collecting and analyzing the responses of civil servants on the Mentimeter online platform. In the second stage, the administrator used the SWOT-analysis system. The tendencies in using information technologies have been determined as follows: the institutional support development; creation of analytical portals for ensuring public control; level of accountability, transparency, activity of civil servants; implementation of e-government projects; changing the philosophy of electronic services development. Considering the threats and risks to the public governance system in the context of applying information technologies, the following aspects generated by societal requirements have been identified, namely: creation of the digital bureaucracy system; preservation of information and digital inequality; insufficient level of knowledge and skills in the field of digital technologies, reducing the publicity of the state and municipal governance system. Weaknesses of modern public governance in the context of IT implementation have been highlighted, namely: "digitization for digitalization"; lack of necessary legal regulation; inefficiency of electronic document management (issues caused by the imperfection of the interface of reporting interactive forms, frequent changes in the composition of indicators in reporting forms, the desire of higher authorities to solve the problem of their introduction); lack of data analysis infrastructure (due to imperfections in the organization of interaction between departments and poor capacity of information resources; lack of analytical databases), lack of necessary digital competencies for civil servants. Based on the results of SWOT-analysis, the strengths have been identified as follows: (possibility of continuous communication; constant self-learning); weaknesses (age restrictions for civil servants; insufficient acquisition of knowledge); threats (system errors in the provision of services through automation); opportunities for the introduction of IT in the public governance system (broad global trends; facilitation of the document management system). The practical significance of the research lies in providing recommendations for eliminating the problems of IT implementation in the public governance sphere outlined by civil servants.

Key words: *Information Technology (IT), Public Governance, Problems of Applying IT, Managers, Administration Process*

1. Introduction

Public governance is one of the most important forms of exercising state power, increasing the efficiency of which is the major challenge of the state. Information management of public services is one of the areas of informatization of public governance sphere. The informatization of public governance is understood as the organizational social - economic process of developing the most preferable environmental conditions in order to meet the needs and ensure the citizens' rights, public administration services, enterprises, public unions based on the promotion and applying information resources.

Information technologies (IT) make it possible to help company staff in receiving, generating and transmitting information from any gadget, being anywhere, around the clock. Along with this, information technologies help provide services to citizens with the ability to quickly and efficiently respond to customers' needs. When using IT, the quality of management increases, as well as the time for making a decision decreases.

However, the modern system of public governance is now facing global digitalization. Consequently, it is necessary to outline arguments on determining the place of information technology in public governance and the system of possible problems in their implementation as well as prospects for the information technology development in public governance sphere.

The relevance of the research is related to digital innovations actively spreading to the public governance sphere and increasingly covering the boundaries of public management, forming a new basis for institutional changes. These changes require competent understanding and systematization. The digitization process involves the free information flow from public authorities to members of the general public and third parties, such as civil society organizations and the media, as well as from members of the general public and third parties to the public authorities.

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After all, it underpins the functioning of open governments successfully undergoing digital transformation. However, we are currently observing a tendency when information and communication technologies are increasingly developing in the private sector, while public authorities, in particular at the regional and local levels, use a bureaucratic governance form.

On this basis, the necessity arises for determining the basic challenges in the field of relations between public governance and information technologies, forasmuch as an understanding of such interconnections can indicate the consequences of the development and spreading information technologies, the establishing relations of public governance in an information - armed society, indicate the functions of information technologies in public governance sphere, outline indicators of the information technologies' implementation level, assess the main disadvantages of information technologies in public management, analyze the use of information technologies by foreign countries, etc.

2. Literature Review

Koval, Sukhanova, Ganapati, & Reddick argue that during the period of the information society's intensive development, information as a resource plays a decisive role in technologies and management processes [1-3]. Creating an information society is currently one of the priority objectives of Ukraine, which is proclaimed in numerous state regulations, concepts, programs and development strategies formulated at various scientific and professional events. The information technologies are the basic driving force in the development of the information society forasmuch as it will contribute to the further development of the country.

According to the viewpoint of Repa, applying information technologies (IT) in public governance is usually understood as a way to increase the efficiency of existing public management bodies, digitization of existing documents, simplification of information dissemination and better control over citizens than as a way to transform the business model of public governance [4]. However, currently, the digital transformation of public governance is more significant and acute than in any other area, which is also mentioned in the well-known imperative document of the OECD e-Government: "E-government is more about government than about "e". Heinrichs, & Laws [5], Lee [6] argue that information technologies in public governance should introduce management practices; consequently, the scientific process of such administration should contribute to the analysis and development of solutions in order to outline opportunities for professional management of transformation processes towards sustainable development.

Borysova describes the category concept of public governance efficiency through the constituent elements of effective public administration as factors determining its content and orientedness [7]. The scholar defines the role and impact of information technologies and information support as a tool for dialogue between the state and the society towards determining the effectiveness of public governance. Dovhan et al. believes that the key model for eliminating the problems of IT implementation in the public sphere is the analysis of the transformation processes of public governance systems through the use of innovative technologies in order to meet the modern society's needs and reduce the monopoly on management by public authorities [8].

According to the viewpoint of Esimov, successful overcoming of the problems of the information space in public governance cannot be envisaged without successful improving the legislation on the use of information technologies in public administration in connection with the introduction of new information technologies and systems [9].

From the perspective of Piasecki, digitization affects all areas of the modern society. In light of the fact that public administrations are closely connected with laws and policies, they are less flexible in adapting to new changes than private companies [10]. In order for the management process in the context of the implementing new information technologies to be successful, the author recommends applying the systems of gamification methods.

Bouckaert [11] & Titova [12] analyze the processes of active implementation of modern information technologies in the public governance process, which is driven by the increase in active interaction of authorities with citizens and legal organizations in electronic form.

The subject matter has acquired wide scientific consideration in the world science. Dimitrijevska-Markoski, & French [13], Lewis [14] argue that the elimination of the problem of applying information technologies in public governance should be based on performance management indicators, as also interpreted by Brillantes & Lorenzo on the example of France [15]. Even in the context of the development of the Philippines, the most important issue facing the discipline of public governance is not only the combination of its identity, but also the functional load. In this way, the Philippine's version of public governance can be described as "5 ES and A", comparing efficiency, effectiveness and cost-effectiveness with three other pillars, namely: fairness, ethics and accountability. Likhtin [16], Prokofiev et al. [17], Petrov, & Saifullina [18] in their investigation, seek to describe the conditions for the transformation of public governance in the digital age on the example of Russia with the help of software ATLAS.ti 9 (http://atlasti.com). The outlined study identified 16 codes, which were grouped into 3 semantic categories, namely: macro-institutional conditions, micro-institutional

conditions and technical conditions for the successful transformation of public governance in the context of digitalization. Sommermann et al. [19] offer a relevant, comprehensive and differentiated analysis of public governance and reforms in Germany with the help of IT, based on key institutional features of German public administration; changes in the relationship between public governance, the society and the private sector; administrative reforms at various levels of the federal system and numerous sectors. Comprehensive understanding of the challenges of introducing IT into the sphere of state management is impossible without analyzing the curricula of bachelors of public governance at universities. Jaarsveldt, & Wessels cover the content of such programs in South Africa in their academic paper [20]. Scientists recommend including competence conception in the field of information and communication technologies (ICT) in the content of the training program. Mauldin in his investigation, continues the educational paradigm and describes the current state of information technologies (IT) in the master's curriculum in public governance, revealing that most training programs do not offer concentrations of IT, core courses or electives [21]. Cary, & Trenton [22], Manoharan & McQuiston [23] have investigated how government officials develop information technology (IT) competencies and how a Master of Public Administration (MDA) degree contributes to such competence. In the United States, according to Puron-Cid's conclusion (2017), a network of schools of public policy, affairs and administration promotes computer literacy standards including ICT skills [24].

The investigations on ICT curricula in public governance education focus on supply (the views of schools and students), neglecting the demand side (the views of employers). The curricula in Latin America have been insufficiently studied, and there are no clear ICT standards [25]. Karim et al. in the context of local self-government in Indonesia, have found that the concept of institutionalization of information technology is not enough to explain the benefits of introducing information technologies for the effectiveness of regional financial management [26]. It is also necessary to take into account the role degree of institutional actors that can potentially influence and have the power to legitimize and mobilize organizational resources in order to direct the institutionalization of information technology towards comprehensive explaining variations in implementation and benefits of information technology into local financial management. According to the viewpoint of McQuiston & Manoharan [27], new technologies, such as: artificial intelligence (AI), Internet of Things (IoT) and blockchain, are changing the way of servicing the public sector. Academic programs in public governance and state policy should adapt the content of education in such a way that a certified public administration manager can immediately apply his knowledge in practice.

In Ukrainian science, Novachenko, et al. [28] have analyzed the application of information technology for increasing the level of economic efficiency and trust in public governance in Ukraine on the basis of the digital management concept in order to integrate the interaction of municipal and state structures with business, the civil society and the population. Therefore, despite the significant amount of scientific investigations on the analyzed topic, the necessity still arises to consider the IT implementation in the public governance sphere and provide recommendations for eliminating these problems.

3. The Research Methods and Methodology

In order to outline the system of problems of applying information technologies in public governance, a two-stage study was conducted.

The first stage involved collecting and analyzing the responses of civil officials on the Mentimeter online platform. The service involves creating and conducting online surveys with a link to the access code. The service is not personalized; consequently, it makes it possible to track only the dynamics of responses, which is indicative. A week has been allotted for working with the content of the first stage's tasks, forasmuch as the platform itself processes the results of the answers and sends the administrator a summary table by e-mail.

In the second stage, the administrator used the SWOT-analysis system. The content of SWOT-analysis in our research involved identifying the internal (highlighting the strengths and weaknesses of IT implementation in public governance) and external (with the selection of opportunities and threats) digitalization environment.

The monitoring data of the first stage of the survey comprised the empirical basis for the analysis of internal and external components of the IT system of public governance.

Number of respondents – 500. Territory – Ukraine. The way of obtaining a link – by e-mail.

4. Results

4.1. The results of the first stage

The first question concerned the identification of tendencies in using information technologies. From the proposed list, the respondents put the development of institutional support in the first place with a result of 39%; the creation of analytical portals towards ensuring public control was in second place - (18%); the level of transparency and accountability of civil servants was ranked on the third place with an indicator of 17%; implementation of e-

government projects occupied the fourth place - (15%); changing the philosophy of development of electronic services received 11%. The results are presented in Figure 1.

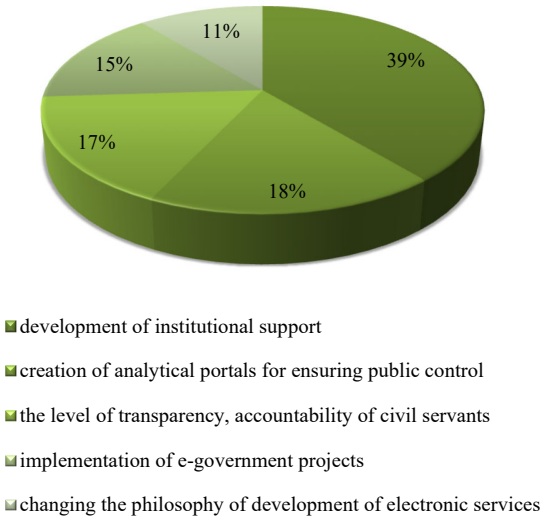

Fig. 1. Identification of tendencies in using information technologies

Considering the threats and risks to the public governance system in connection with applying information technologies, the respondents have identified the following aspects generated by societal requirements, namely: composing a digital bureaucracy system took first place - (51%); retention of information and digital inequality - (19%); insufficient level of knowledge and skills in the field of digital technologies, reducing the publicity of the system of state and municipal government received 15% of answers. The results are presented in Figure 2.

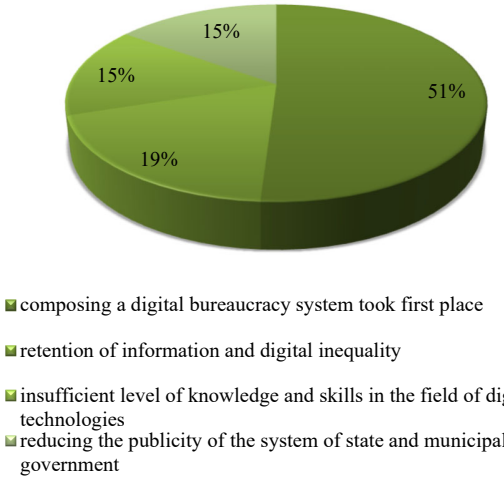

Fig. 2. Aspects of threats and risks to the public governance system in connection with applying information technologies

Highlighting the weaknesses of modern public governance in the context of IT implementation, respondents drew attention to the following issues, namely: conducting "digitization for digitalization"; lack of necessary legal regulation; inefficiency of electronic document management; lack of data analysis infrastructure, lack of civil servants' necessary digital competencies. These answers received 27%, 26%, 19%; 15%, 13% respectively. The results are presented in Figure 3.

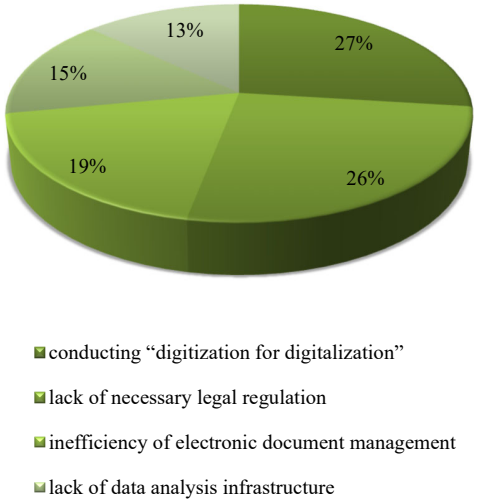

Fig. 3. Weaknesses of modern public governance in the context of IT implementation

The inefficiency of electronic document management and the lack of infrastructure for data analysis were identified as two separate problems. The basic reasons for the inefficiency of electronic document management are as follows: the problems caused by the imperfection of the interface of reporting interactive forms (37%), frequent changes in the composition of indicators in reporting forms (36%), the desire of supreme authorities to solve the problem of their introduction (27%); as well as the lack of data analysis infrastructure due to imperfections in the organization of interaction between agencies (39%): insufficient capacity of information resources (36%); lack of analytical databases (25%). The results are presented in Figure 3.

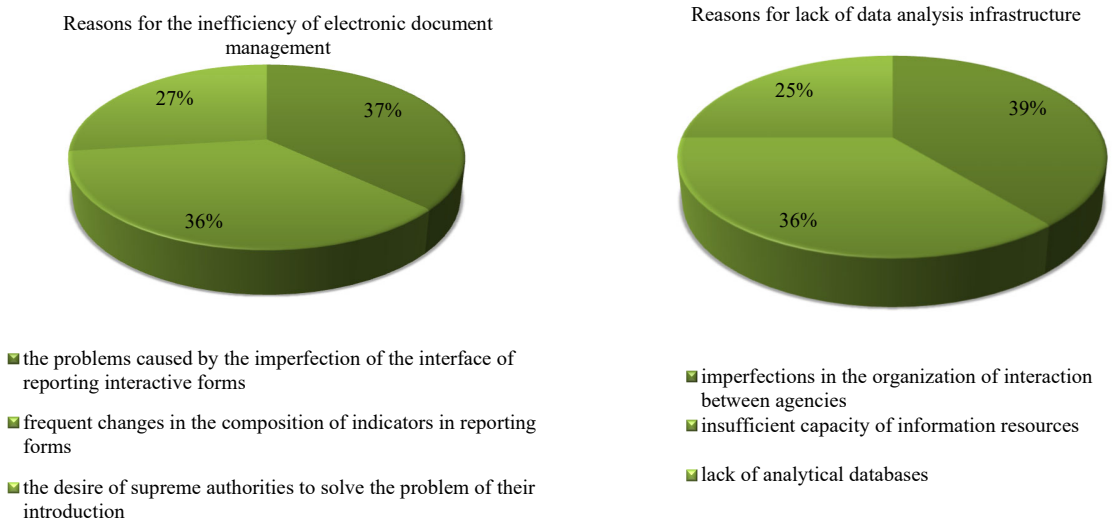

Fig. 3 The basic reasons for the inefficiency of electronic document management and reasons for the lack of data analysis infrastructure

4.2. The results of the second stage

Based on the responses obtained, the author has compiled a table of SWOT-analysis in order to identify internal (with highlighting the strengths and weaknesses of IT implementation in public governance) and external (with opportunities and threats) digitalization environment. The results are presented in Figure 4.

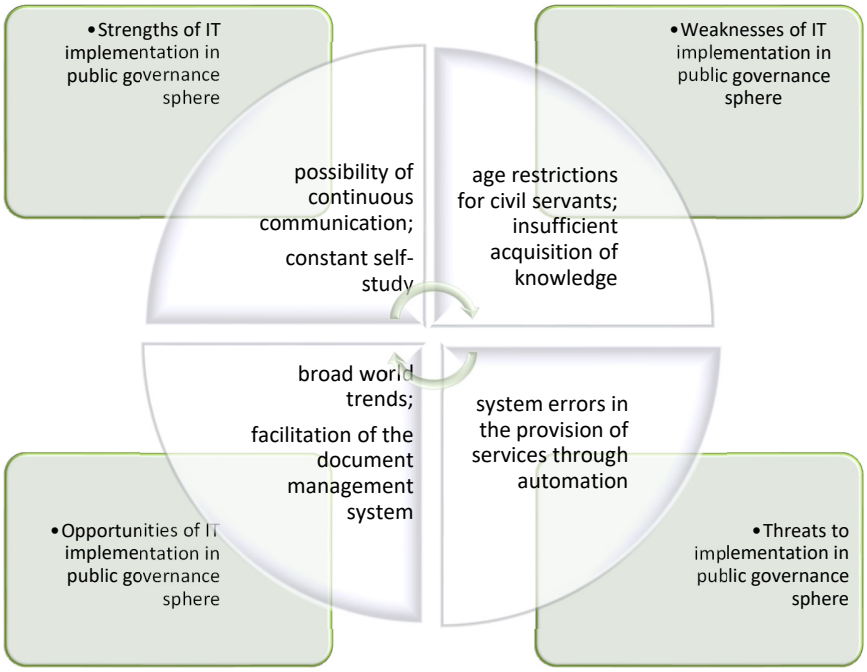

Fig. 4. SWOT-analysis of the problems of IT implementation in the public governance sphere

Therefore, the obtained results have outlined the grounds for scientific discussion and recommendations for elimination of problems.

5. Discussion

The analysis of our research as well as the Likhtin's study indicates to the fact that the success of the public governance transformation in the era of digitalization is directly related to the efforts and resources allocated by the public sector bodies towards implementing the law and the timing of its introducing. In other words, the intertwining of macro-institutional, micro-institutional and technical conditions plays a crucial role [16]. Along with this, the civil servants' competencies at all government levels are a unifying element, a generative factor in the implementation of both macro-institutional, micro-institutional and technical conditions for the public governance transformation in the era of digitalization.

The content of our research is supported by the material presented in the studies of Bouckaert [11] & Titova [12]. The scholars believe that in order to conduct a detailed analysis of active implementation processes of modern information technologies in public governance sphere and optimize the process of providing public services in electronic form, it is necessary to consider the basic actions and principles to be followed in the process of transforming public services into electronic form. The authors also recommend the implementation of optimal low-budget measures aimed at increasing efficiency of the process of providing public services in the context of electronic modernization.

It should be noted that the method presented by scientists Holzer, & Schwester in world science for obtaining information on the analyzed topic was the most thorough one [29]. They discuss the broad integration of 311 multi-channel communication systems and analyze future trends and issues related to information technologies and the government. The concept of network and its security was important for understanding in our research, forasmuch as they develop, accumulating information and including visualization. Therefore, convergence and innovation benefit public managers in their quest to provide more efficient and effective services to their citizens.

Novachenko et al. have identified the same tendencies in applying information technologies as the respondents of our academic paper, namely: the institutional support development; creation of analytical portals in order to ensure public control; level of accountability, transparency, activity of civil servants; implementation of e-government projects; changing the philosophy of electronic services development [28].

Furthermore, we reaffirm the viewpoint of Jaarsveldt, & Wessels that ICT competence should indeed be included in curricula on public governance for students due to the need for contextual relevance and specific professional requirements of the civil service [20].

Silva, et al. propose to analyze the influence of organizational factors on the implementation of public governance systems, which have a positive impact on the perception of the system quality, as well as the positive impact of quality on the system's benefits, perceived by users [30].

6. Conclusions

Therefore, in the context of analyzing the problems of IT implementation in the public governance sphere revealed by civil servants, we hereby can provide the following recommendations for their elimination, namely:

- outline the necessity to develop and conduct a large-scale study of the implementation of new information and telecommunications technologies in the government's practical activities;
- to qualitatively create an electronic communication system of public governance in each specific state structure at the interdepartmental level;
- to analyze the emergence of problems using experts' interviews and mass polls of civil servants aimed at terminating unclaimed functions using electronic information platforms;
- to introduce a productive online dialogue between all interested parties aimed at increasing the public officials' competitiveness;
- to maintain a system of constant detailed control over the processes in the relevant area in real time on the website of the department;
- to maintain online criteria for objective, complete, timely information about problems in the public authorities' activities;
- to promptly eliminate the emergence of possible negative tendencies in the interaction of government bodies with the population.

In such a way, the recommendations proposed in the academic paper can significantly increase the digitalization effectiveness in public governance sphere, forasmuch as the use of information technologies in public administration significantly saves time spent on solving various problems; it contributes to the dynamics of state development and managers' transparency.

An important direction of further scientific investigation will be an attempt towards concluding a list of a system of effective online platforms for conducting e-government affairs.

The practical significance of the research involved providing recommendations for eliminating the problems of IT implementation in the public governance sphere outlined by civil servants.

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