Information and communication technologies in e-commerce and e-governance

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Abstract. The development of information and communication technologies has reached a level where their use in business and governance is becoming not only expedient but also inevitable. The Internet and ICT have created the technical and technological foundation that can significantly improve the efficiency of public administration, provide businesses and citizens with access to necessary information, simplify bureaucratic procedures and reduce the time for decision making. The paper describes the new conditions in which the business is developing. The article presents the features of the interaction of e-government and business, the impact of e-government on the development of the economy as a whole. The authors analyzed the process of development of technologies for e-government and e-commerce. The authors identified the tasks that are solved by means of e-government. Also, the authors set up indicators for evaluating the effectiveness of the e-government. The implementation of the e-government demonstrates advantages for the further development of the economic sector and the whole state in general.

1. Introduction

The use of the Internet and the introduction of innovations in the field of processing and storing data enable governments to develop strategies for the development of e-government, define its goals, and create agencies coordinating its activities.

For the last ten years, the governments of the leading world powers have used Internet technologies and at the moment there is hardly any aspect of government activity that would not be associated with the use of ICT.

It can be stated that ICT has become an essential element of the national infrastructure, the foundation of economic, political and social activity of the state. Given the scale of the state apparatus, it is safe to say that any government receives significant benefits from the use of ICT providing government e-services.

At present, the development of the electronic services market has become a priority of economic policies of many countries, as evidenced by the increase in the number of documents regulating economic relations in this area, particularly, the project of e-government creation and a plan for the transition to electronic services provided to the public and business.

The concept of e-government originated in the West in the late 1990s and represented the idea of widely introducing ICT into the work of government agencies and departments to increase the efficiency
of government work. Then this concept was expanded and transformed into an e-government business model, which is a service-oriented state, whose work is based on communication with society [1].

Over time, the concept of e-government has evolved from means of improving the quality of public services through the use of ICT to a method of transforming the communication between a state with society and changing the state itself in order to increase the efficiency of its activities.

There are many definitions of the term “e-government”. The distinction between them is not only in semantics but also in the priority of state strategies that these definitions characterize. Despite this, they all are united by the fact that the main characteristic of e-government is the most complete and most efficient implementation of the capabilities of modern information and communication technologies for the creation of a service-oriented state with the ability to provide government e-services 24 hours a day and 7 days a week [2].

An analysis of the literature has demonstrated that all definitions of the term “e-government” can be divided into three categories:

- E-government is the provision of e-services by the state, i.e. electronic consultations, etc;
- E-government is a system of modern information and communication technologies used in government and covering all aspects of government activity;
- E-government is the ability to transform government through the use of ICT, it is a new form of government based on the use of ICT.

Having analyzed all existing definitions of the term “e-government” we can define this concept as follows: e-government is a system of using modern information and communication technologies, and in particular, the Internet, as a tool for managing the state that contributes to the effective functioning of all state agencies and first of all the government.

Businesses and citizens are the recipients of e-government services. Communication of subjects of social and economic life (citizens and enterprises) with the state has two forms and is indicated by abbreviations indicating the area of contact of the subjects with each other: G2B – from government agencies to private enterprises business, G2C – from government agencies to individual citizens.

As a rule, e-government services for business mainly include services related to the registration of an enterprise, the signing of contracts, the provision of tax and customs declarations, payment of fines etc., whereas e-government services for citizens consist of registration services, payment of taxes and fines, social insurance services, advisory services, and so on.

As seen in table 1, number of countries providing G2B (Government to Business) or G2C (Government to Consumer) services rising dramatically from 2014 to 2018. It is obvious that the inclination of digitalization and mobilization also fosters the quality and quantity of e-government services.

| Table 1. Number of countries offering transactional services. |
|---------------------------------------------------------------|
| Trends of Transactional Services Online | 2014 | 2016 | 2018 | 2016 to 2018 | 2014 to 2018 |
| Pay for Utilities | 41 | 104 | 140 | 26% | 71% |
| Submit Income Taxes | 73 | 114 | 139 | 18% | 47% |
| Register a Business | 60 | 97 | 126 | 23% | 52% |
| Pay Fines | 42 | 76 | 111 | 32% | 62% |
| Apply for a Birth Certificate | 44 | 55 | 86 | 36% | 49% |
| Apply for Marriage Certificate | 39 | 53 | 82 | 35% | 52% |
| Register a Motor Vehicle | 33 | 47 | 76 | 38% | 57% |
| Apply for Drivers License | 29 | 38 | 62 | 39% | 53% |
| Apply for Personal Identity Card | 27 | 31 | 59 | 47% | 54% |
E-government services also include access to government information, government departments, archival files of the tax administration, information on employment and opportunities for business, etc.

Figure 1 shows that increasing number of countries are adopting openness and participation by open data approach and this positive trend is enhancing the transparency of governments and public entities.

![Figure 1. Countries with Open Government Data Portal and/or Catalogues in 2014, 2016 and 2018. Source: United Nations E-Government Survey 2018 [3].](image)

In our work, we focus on the government-business relationship and the aspects related to economic development and the impact on the economy produced by the introduction and deployment of e-government.

2. Related Work

Attempts to systematize and unify the concepts of e-commerce and e-business have been made by many authors, such as De los Santos B., Fatonah S., Holland C.P., Qin Hu L. et al. [4], [5], [6], [7]. Among the scientific papers of economists who studied the nature and specifics of electronic services, should be noted the papers of the following authors: Chou Y.-C., Gefen D., Hepp M., Josang A., Li Y., Sun Z., Xu X. et al. [8], [9], [10]. The process of providing e-services and the issues of ensuring their quality are investigated in the papers of Ahmad A., Collier J.E., Santos J. et al. [11], [12], [13]. Further development of the study of electronic services is presented in the articles of Chaparro-Peláez J., Kivijärvi M. et al. who studied models of managing interactions with electronic service consumers [14], [15]. The problem of creation and development of e-government, the classification of different stages of e-government creation are described in papers of such authors as Heeks R., Layne K., Petter G., Yildiz M. [16], [17], [18], [19].

Analysis of scientific papers concerning the problem of e-governance development revealed an insufficient level of research on this topic. On the one hand, this is due to its novelty and the lack of a detailed theoretical and methodological framework. On the other hand, the reason for the insufficient level of research of the problem under consideration is the complexity of research of the electronic services market in the system of modern economic relations. This complexity caused by the rapid development of this field, which is far ahead of the development of the theory.

3. Impact of the Introduction and Development of e-Government on the Economy

Governance reforms are one of the most important issues for the government. The need to respond to globalization, the evolution of society and the expectations of business and citizens means a continuous process of reform.
It is possible to identify common elements inherent in this process, for example, the requirement to perform more in a lesser time. However, in different countries, the pace and nature of reforms differ and correspond to the conditions and cultural traditions of the countries in which they take place.

The practice shows that the reforms are aimed at solving a whole range of management tasks: to increase the level of transparency and accountability, increase work efficiency, increase revenues and reduce costs, etc.

In the majority of e-governance areas, it is ICT that is an important tool for implementing reforms. The main reason for the use of ICT in government work was the desire to improve the quality of public services, increase accountability, transparency and simplify the process of providing these services.

E-government, having a great potential for expanding the scope of application of information and communication systems in government, makes possible wider access to information, which in turn significantly increases the degree of public responsibility to society.

Let us identify the tasks that are solved by means of e-government:

- E-government contributes to increasing the efficiency of the country's government. Currently, ICT is a stimulant of reforms aimed at improving the work of government and increase the productivity of internal operating systems such as financial systems, procurement, payment, internal communication systems and information exchange. Internal information networks enable state structures to create integrated databases and establish a higher level of communication, which contributes to accelerating the process of information exchange, increasing the pace of public services, improving and accelerating processes of decision making.

- The transition to e-government leads to cost reduction and efficiency gains. The provision of public services through modern ICT significantly reduces the cost of data processing compared to the traditional way of providing services. The use of ICT also improves the efficiency of public service delivery processes by allowing collective access to data from various government agencies. This reduces the time spent on transactions and eliminates errors that may occur during manual processing of information. Moreover, by simplifying internal processes, faster and more accurate decision making becomes possible.

- E-government allows creating internal communication networks between the state and the subjects of social and economic life in order to integrate technology, information, and knowledge. Due to this, for example, it becomes possible to establish effective interaction between government agencies and enterprises. Moreover, the provision of integrated services is impossible without the communication of many government agencies and departments, which leads to the creation of a large and multilateral network of relationships.

- Improving the quality of public services provided is one of the main components of state administrative reform, where the main role is played by modern ICT. The use of ICT allows improving the process of providing public services and at the same time serves as the main component of the e-government creation process.

In particular, the use of the Internet has made it possible to significantly increase the number of consumer-oriented government e-services, which are aimed at expanding the sphere of public administration, as well as accelerating the pace of provision of services to business compared to the traditional model, where the processes require a lot of time for implementation and might be ineffective and intransparent. Providing online services within the framework of the e-government concept reduces bureaucratic costs and provides access to public services at any time and from any place, speeding up transaction processes and making them more reliable and more efficient in terms of time. It should also be noted that the recipients of government e-services interact with e-government; therefore, their dissatisfaction with the quality of these services can quickly become a serious problem.

- Improving governance mechanisms through the creation of e-government helps to more successfully achieve economic and political goals: from the spread of e-commerce and reducing
tax requirements through the implementation of more effective programs to the establishment of e-democracy.

- E-government increases the level of transparency of decision-making processes and the degree of accountability of state structures, and also contributes to the reduction of corruption. Involving business and citizens in the work of e-government by giving them the opportunity to submit their ideas and suggestions on special sites on the Internet increases the degree of transparency in the functioning of state structures. In this case, business citizens have access to government information, standards, government plans and the need for personal visits to state institutions disappears.

- E-government helps to implement the reform program more effectively. Thus, in accordance with the modernization program, the implementation of e-government allows us to identify defects and weaknesses in the management system and develop the necessary changes that implementation will improve the quality of e-services provided and increase the efficiency of the management system as a whole.

- E-government increases business and citizens' confidence in the government. E-government by improving information flows and encouraging business and citizens to communicate with government agencies helps to increase confidence in the government, and this, in turn, improves the quality of government e-services provided by the state having a large amount of information, the use of which properly allows you to quickly make quality decisions and, therefore, better serve the interests of business and society.

- The use of modern ICT within the framework of the e-government concept contributes to achieving great results in key areas such as business, healthcare, social security, and education. The government and government agencies are created to solve political and economic problems and ICT plays the role of the main driving force in the development and improvement of all major areas of business and society.

Thus, thanks to the implementation of the concept of e-government, the following tasks are solved:

- access to public services for citizens and enterprises is simplified;
- involvement of the population and business in issues of public administration is growing;
- communication between business, citizens and the government is improved;
- the efficiency of the government increases.

In our opinion, in the context of the implementation of e-government, the following indicators for evaluating the effectiveness of the e-government should be applied (table 2).

| Sector      | Indicators of the sector efficiency                                                                 |
|-------------|-----------------------------------------------------------------------------------------------------|
| Economic    | • software costs                                                                                 |
|             | • hardware costs                                                                                 |
|             | • the cost of communication                                                                      |
|             | • the cost of improving the computer literacy of the population                                  |
| Organizational | • the existence of a legislative and regulatory framework governing the introduction of           |
|             |   information and communication technologies in public administration                            |
|             | • the existence of authorized agency whose activities are aimed at implementing the policy of     |
|             |   informatization                                                                               |
|             | • availability of telecommunications infrastructure                                              |
|             | • the number of civil servants who can use e-government tools in their activities                 |
| Social      | • the degree of availability of information on the activities of public authorities               |
|             | • the number of services provided in electronic form                                              |
the part of public procurement that can be performed online
Accountability
• the availability of complete and relevant information, equal and free to access for all representatives of business and society
• conducting public opinion polls through the use of Internet resources
• the facts of the influence of public opinion on the decisions and bills made through the use of Internet resources
• collecting information (through feedback) on the work of the interaction mechanism, control over government organizations on key indicators of the effectiveness of their activities

The indicators for evaluating the effectiveness of the economic sector is a quantitative assessment of the ratio of effect to costs in specific conditions: savings resulting from optimization and rationalization of activities; it characterizes the saving of efforts, means at the moment in the functioning of an enterprise in the given environmental conditions. The economic efficiency indicators characterize how the estimated activity is implemented, how efficiently the resources are used and how efficiently the activity is performed.

The implementation of the concept of e-government has undeniable advantages for further development and the successful functioning of the state and the economic sector.

4. Quality Standards for E-government Services
The development of the concept and implementation of e-government requires the development of uniform quality standards for e-government services that provide an effective system of interaction between government and business.

The development of a unified standard for assessing the quality of e-government services includes the consistent implementation of the following steps:

• an inventory of legislation to identify the requirements for e-government services,
• monitoring the quality of e-government services,
• development of regulatory legal acts defining requirements and quality standards of e-government services.

The process of creating a quality standard of e-government services is an analysis of the properties of an e-government service and has three aspects:

• the quality of the information and communication structure of the e-government services;
• the quality of the process of providing e-government services in electronic form;
• the quality of the final result, i.e. the quality of the e-government service provided.

When creating uniform quality standards for e-government services, it is necessary to take into account the peculiarities of the process of providing these services by government agencies and departments at the regional and municipal levels.

In our opinion, the requirements of information technology of the process of providing e-government services and its quality should be the basis for the standardization of e-government services. In other words, the standards of e-government services should include the most important requirements for the quality of these services, even if they coincide with existing ones.

The structure of the quality standard for e-government services might be as follows:

• Purpose of e-government service.
• Formal representation of the target group of e-government service consumers.
• Requirements of information and technical support for the process of providing the e-government service.
• Requirements for the availability of the e-government service for its customers.
• A detailed description of the process of providing e-government service.
• Security of the e-government service.
• Quantitative indicators for assessing the quality of providing the e-government service.
• Qualitative indicators for assessing the quality of providing the e-government service.

It should be noted that the development of a system of standards for the quality of e-government services should be focused on the actual improvement of the quality of state e-services provided and optimization of budget expenditures of e-government authorities. It is important to realize that the standard plays the role of a vector of quality improvement, i.e., optimization of the expenditures of state structures should be aimed at solving the most pressing problems of business and society and at the highest possible implementation of quality standards.

5. Conclusion

According to the concept of e-governance, the entire system of executive authorities’ functions as a single service organization designed to provide services to the public. E-government activities should be sufficiently open, transparent and accessible to citizens and businesses. Particular attention is paid to the principle of feedback, speed, and quality of service provision through the extensive use of centralized Internet systems. All this is intended to improve both the quality of government services provided to the population and business structures and the efficiency of the government itself. In general, e-government is a specialized integrated system of interaction between the structures of the executive branch of power, citizens, civil society organizations and business via the Internet.

In this article, we examined the important issues related to the development of e-government, its interaction with business and the impact on the economy as a whole. The understanding and definition of e-government in the current conditions are presented. The variety of the principal tasks solved by e-government, which relate primarily to the economic life of the country and society, is formulated.

To assess the quality of e-government services that provide an effective system of interaction between government and business, the development of uniform standards is required. The article proposes a universal structure of the quality standards of e-government services. In addition, the indicators for evaluating the effectiveness of e-government are defined.

Thus, through the use of the Internet and ICT, citizens and businesses have new opportunities, such as raising awareness of current economic and political problems, increasing feedback from government institutions, influencing the formation of the agenda and the process of making important political and economic decisions.

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