

## The Use of E-government from the Perspective of Biggest Business Entities in Serbia

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### Abstract

The development and use of information and communication technologies (ICTs), and in particular the Internet, have changed the way businesses operate in the last twenty years, providing a number of new opportunities for improving innovation and competitiveness. Today, modern ICT is considered to be the basis for the development of a knowledge society, in which the concept of e-government plays a special role. The main goal of this paper was to examine the perceptions of business users, in terms of perceived barriers and benefits achieved, from the use of electronic public administration services. The survey included 500 companies with the highest business income in Serbia. The data collected were analyzed using Pearson's correlation coefficient, Mann Whitney's test and Kruskal-Wallis test. The results of the research showed that the level of acceptance of electronic services is still lower than expected, given the volume of services offered. Also, this study pointed to the need to raise the level of awareness of businesses about e-government services, as well as the need to improve the quality of electronic services, in terms of complete digitization, alignment with enterprise requirements and regular updating of data.

**Keywords:** ICT, e-government, business entities, Serbia

### 1. Introduction

The interest in the modernization of the public sector has grown rapidly in the last ten years, and the introduction of electronic services is a key element of public administration reform. E-government initiatives are present in all democratic systems reform programs in developed Western European countries [1]. According to the OECD [2], e-government represents "the use of information and communication

technologies, and especially the Internet, as a means of achieving better public administration.” The application of information and communication technologies enables greater transparency in the work of state bodies, while reducing corruption [3]. In the first stages of digital governance development, investments have focused on technology that supports the development of electronic communication with stakeholders, and lately, as the problem of low acceptance of e-government becomes increasingly apparent, the focus is shifting to users [4]. Considering the results of previous research, it was concluded that all user groups play a very significant role in ensuring the long-term success of the e-government project [5]. The electronic public service provides a range of benefits to its users (citizens, businesses, the public sector, the non-profit sector). However, the expected benefits for the state administration cannot be materialized immediately, but only at the moment when most interactions with the government are realized through the Internet. One of the obstacles to the development of e-government is the nature of public service, which, with all its obligations, is not in a position to easily and swiftly dispense with paperwork procedures, as soon as the opportunity for the implementation of electronic services becomes available [6]. Lessa et al. [7] point out that the failure rate of e-government implementation is very high, especially in developing countries and transition democracies. According to Heeks [8], 85 percent of e-government projects have experienced partial or complete failure in developing countries. Regardless of the level of development or the form of social ordering, there are numerous benefits that the concept of e-government can provide for any society. First of all, the modernization of public administration and the introduction of modern information and communication technology into the state sector increase the efficiency and effectiveness of all business processes. Another reason, crucial to the necessity of implementing e-government, is democratic reform of the state structure, promotion of democratic practice and transparency in the work of state bodies [9]. For Serbia, the issue of digitalization of public administration is particularly important because of the accession process to the European Union. It is required to align the objectives of the Europe 2020 Strategy and the Digital Plan for Europe initiative [10], one of the priorities of which is to create a single digital market based on high-speed internet and interoperable applications. In the last ten years, some effort has been invested, both in the development of information technologies and in their application in the work of state bodies [11]. However, according to the results of a recent two-year United Nations survey, Serbia has not made progress on the global list when analyzing the performance of state-owned e-services [12]. The paper presents the basic results of the research, which aims to identify the most significant advantages and limitations, detected by business entities in the process of using e-services. The paper is divided into five sections, including introductory notes. The second section provides an overview of the relevant e-government literature, which served as the basis for defining the methodological framework of the research. The third part contains a description of the applied statistical methods of data processing, analysis of the obtained results and comparison with previously published data. Section 4 outlines the limitations of the research conducted, as well as suggestions and recommendations

for future research. Finally, the last section contains concluding considerations and practical implications of the results, which are significant for the further development of e-government in transition countries. The survey was conducted on a sample comprising of 500 largest economic entities, the size of which was measured by the amount of business income generated in 2017, in the territory of the Republic of Serbia (based on data from the Serbian Business Registers Agency (SBRA)). This group of companies is significant for the Serbian economy because it generates more than half of the income of all companies in the country, and also, these companies operate in different sectors and through relationships with suppliers and customers, to some extent, create flows in the Serbian economy [13] and consequently, influence future trends in e-business of Serbian companies.

This paper raises the following research questions:

**RQ1:** How much has the e-government service been used by the most profitable companies in Serbia in the last six months?

**RQ2:** What are the reasons for the possible disuse of e-government services?

**RQ3:** Is there a relationship between the level of use of e-services and the affiliation sector, type of business or size of business?

**RQ4:** What are the most significant benefits of digitizing the administration, from the perspective of business entities?

**RQ5:** What are the most significant obstacles to the digitization of government, from the perspective of business entities?

As a result of the aforementioned research questions, the main objective of the study is to analyze the use of an electronic public service and identify the motivating and limiting factors for its adoption from the perspective of business organizations. The information on the extent of use and reasons for not using e-government services, as well as the benefits and barriers that users encounter in the course of electronic communication with public administration, provide a better insight and clearer picture of the current state of e-government development and the information basis for policy making, which will advance the user-focused government and stimulate the adoption of electronic public services. The results of this research are important, first of all, because of the lack of academic papers focused on business users and their use of e-government services in transition countries, as well as because they provide better insight into the possibilities of successful implementation of e-government systems.

## 2. Literature Overview

The concept of e-government emerged in the late 1990s, but the development of information systems of governmental organizations can be traced back decades, from the beginnings of computer history [14]. The rapid advances and constant changes in the field of information and communication technologies (ICT) have led to the need to innovate communication channels at all levels of government and to modernize the state administration. E-government development projects, due to their complex nature, have had broader political, social, and economic implications for society as a whole [15]. Today, e-government is seen as a means of reducing red tape, increasing

the efficiency and effectiveness of public service, and strengthening democratic structures [16]. Many previous studies have highlighted the existence of a gap between the quality of government supply and the level of use of e-government services [17]. There are a number of factors that impede digital collaboration between government and users and lead to the formation of a communication gap, both on the supply side and on the demand side. Previous research has confirmed the difference between developed and other countries in terms of the spread of electronic public service [18]. Most of the e-government development strategies adopted are based on successful experiences from developed countries, which cannot be directly applied to developing countries. In recent years, significant progress has been made in developed countries in the e-government implementation process [19], which further widens the existing gap and increases the gap between leaders in the digitalization of public administration in less developed countries. According to Azad et al. [20], this inequality is explained by the action of institutional factors, which include: democratic practice, transparency of private sector operations, perception of corruption and freedom of the media, while other authors place this topic in a wider context, taking into account the work of history and culture, infrastructure, citizens and government sector employees, with particular reference to their IT capabilities [21]. The modernization of the public sector and the application of information and communication technologies are an essential part of Serbia's European integration process and accession negotiations. In this context, the current Strategy for the development of electronic communications from 2010 to 2020 sets the implementation of e-government as one of the development priorities for the coming period [22]. Regional cooperation and partnership between the public and private sectors can significantly contribute to the development of the e-government concept, which focuses on the interests of users in the Southeastern Europe region [23]. It is noticeable that more and more private sector companies are cooperating with state institutions on joint projects in the field of ICT, as a basis for digitalization of public administration [24].

### 3. Research Methodology

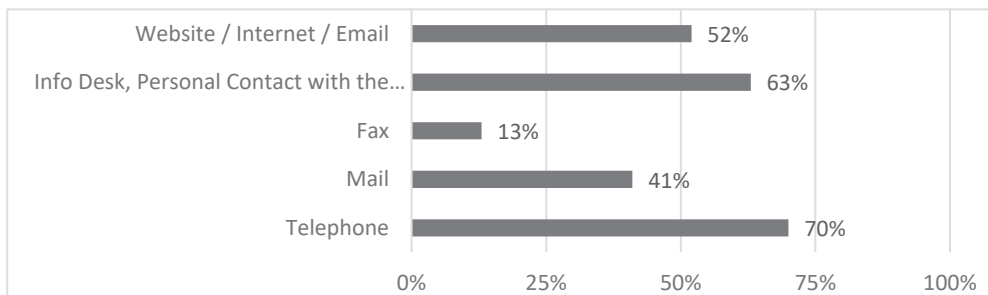
The survey included 500 companies with the highest business income in Serbia. The sample frame consisted of a database of companies registered with the Business Registers Agency, which submitted the annual accounts for the 2017 fiscal year. Enterprises covered by the sample belong to different industries, regions, ownership structures and size. The survey used an online survey as a method of data collection. Twelve companies were excluded from the sample due to the inability to determine their email address, due to the lack of transparency of information regarding their business and the lack of publicly available sources, such as company websites. The invitation to participate in the survey, with a link to the questionnaire, was sent by e-mail to all other listed companies (488 companies in total). The letter also included an explanation of the purpose of the research, instructions for completing the questionnaire, and contact information for further clarification. The online

questionnaire, uploaded in the form of a Google document, was available to businesses for 21 days (from September 24 to October 15, 2018) and one email reminder was sent during that period. Non-delivery messages were returned from 23 email addresses. The questionnaire used in this research partly relies on previous e-government research [25]. However, it has been significantly modified and adapted to the conditions and state of development of e-government in Serbia. In the survey, 37 participants were asked in the decision-making process in the field of e-government. Employees at higher levels of management were interviewed to gain insight into their views regarding the use of e-government services. The questions are divided into four sections, covering four main topics, which are also the subjects of research. The first part of the questionnaire relates to basic data such as: number of employees (size of company), location (region), form of ownership and activity of company. The second part of the questionnaire is aimed at gathering information on the level of representation of various forms of e-commerce among business entities, the level of use of the electronic public administration service, as well as possible reasons for not using it. In the third part of the questionnaire, businesses evaluate the benefits of using e-government services, and the last part deals with the perception of the most important barriers to its adoption by businesses. Both sections contain a set of claims that describe the different benefits or benefits, limitations, and for each claim, respondents rate the degree of their agreement or disagreement, on a six-point scale. All questions asked in the survey are of a closed type, with modalities of answers being offered. Quantitative analysis of the obtained data was carried out with the help of the SPSS software program. The matrix in SPSS was formed based on a questionnaire. Also, the analysis of descriptive statistics was used to edit and group the data, as well as the parametric test Pearson's correlation coefficient, to calculate the correlation of variables (the use of e-government services with the affiliation sector, type of activity and size of enterprise). Non-parametric tests were also used in the study: Mann Whitney test (or Rank sum test) to compare employees in manufacturing and service companies using individual e-government services, and the Kruskal-Wallis test to compare employees in enterprises of different sizes in assessing the benefits use of e-government.

#### **4. Results**

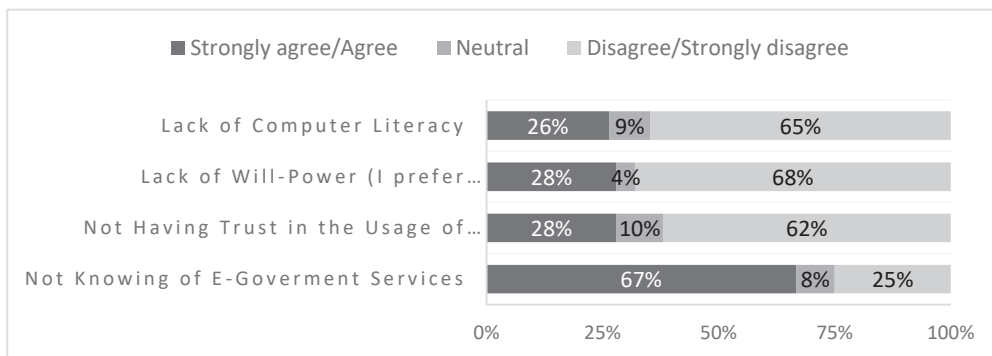
Representatives of 83 companies operating in the Republic of Serbia were surveyed, representing 17% of the total number of companies (488) invited by e-mail to participate in the survey. Considering the size of the surveyed companies (i.e. the number of employees), the representation of small (29%), medium (40%) and large (31%) enterprises is quite balanced. The sample covers enterprises operating within the service (64%) and manufacturing (36%) sectors, the largest percentage belonging to the private sector (85%), while 15% is state-owned. The regional structure of the sample indicates the highest presence of business entities from Belgrade (72%) and Vojvodina (22%), while the least surveyed companies are from Central Serbia (6%). Descriptive statistics were analysed to answer the first two research questions

regarding the level of use of e-government services and the reasons for their possible non-use (in the last six months). Based on the data collected, it was found that the most common channels of communication of the economy with the state administration are: telephone (70%) and personal contact with government officials (63%), while the Internet is most commonly used by 52% of companies surveyed in communication with public administration (Graph 1).



Graph 1. Frequency of responding of the surveyed business entities to the question related to the choice of the most common channels of communication with the state administration, in the last six months (expressed as a percentage). Note: Respondents were given multiple answers.

Of the surveyed businesses, 80% said they had used e-government services in the last six months. Most of the remaining 20% of respondents stated that such a situation is a result of ignorance of the Government’s offer of electronic services (67%), while more than half of the surveyed companies disagree with the statement that lack of information literacy (65%), trust in the use of internet services (62%) or lack of will (68%), the reason for not using e-government services (Graph 2).



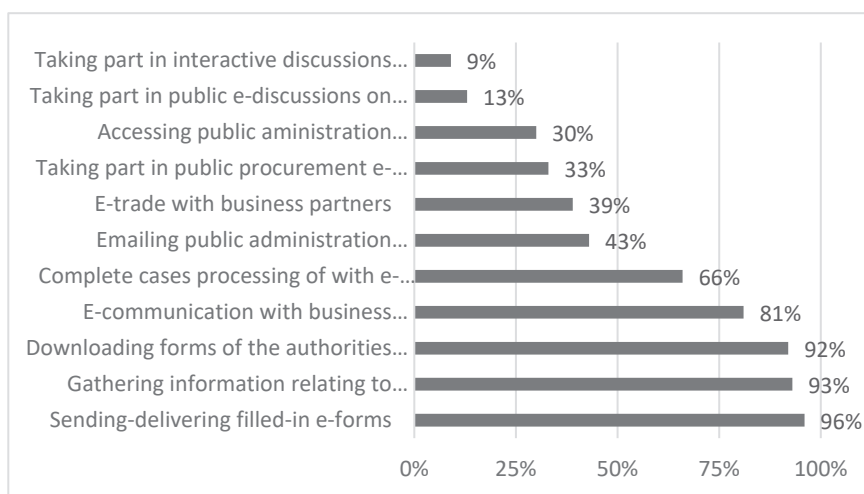
Graph 2. Frequency of responses of the surveyed business entities, indicating the degree of their agreement or disagreement with statements describing the reasons for not using e-government services in the last six months (expressed as a percentage). Note: Respondents were given multiple answers.

According to the Mann Whitney test, a difference was found between respondents employed in manufacturing and service companies, in assessing the claim of “unfamiliarity with e-government services”. Respondents employed in the service

sector indicated that at a majority of them were not familiar with e-government services ( $Z = -2.134, p = 0.033$ ).

The Mann Whitney test did not identify differences between respondents of employees in public and private companies in evaluating claims regarding the reasons for not using e-government. The Kruskal Wallis test indicated that there were statistically significant differences between employees of enterprises of different sizes, in assessing claims related to lack of will ( $\chi^2 = 9,920, p = 0.007$ ) and lack of computer literacy ( $\chi^2 = 16,896, p = 0.007$ ), meaning these two items were rated the highest by employees of medium size companies.

In order to answer the third research question, which relates to establishing the connection between the level of use of e-services and the affiliation sector, type of activity and size of the company, a Hi-square test was applied. The use of e-services according to the conventional statistical criterion does not depend on the type of activity ( $\Phi = -, 205, \text{Pearson's } \chi^2 = 3.471, p = 0.062$ ), but this correlation is marginally statistically significant. Also, the use of e-government services does not depend on the size of the enterprise ( $C =, 210, \text{Pearson's } \chi^2 = 3.830, p = 0.147$ ), ownership ( $\Phi =, 027, \text{Pearson's } \chi^2 = 0.061, p = 0.804$ ), or location of the enterprise ( $C =, 139, \text{Pearson's } \chi^2 = 1.624, p = 0.139$ ).



Graph 3. Frequency of responses of business respondents to the question related to the purpose of Internet use, in the last six months (expressed as a percentage). Note: the respondents were given multiple answers.

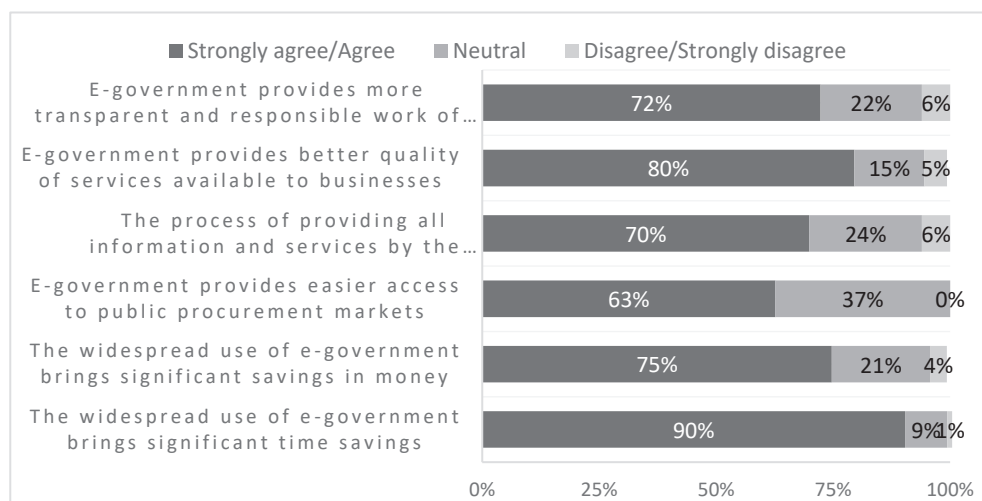
As shown in Graph 3, businesses use the Internet most to send (submit) completed forms electronically (96%), while the smallest percentage of surveyed business representatives use e-participation opportunities, such as participating in interactive discussions on the e-government Portal Forum page (9%) and participation in electronic public discussions (13%).

The analysis of sectoral differences regarding the purpose of internet use by the surveyed companies is based on the Mann Whitney test. According to the rank

averages, it can be concluded that employees of state-owned enterprises used the Internet more to obtain information ( $Z = -2,455$ ,  $p = ,014$ ), download forms ( $Z = -1,966$ ,  $p = ,049$ ) and complete case processing ( $Z = -1,858$ ,  $p = ,063$ ), and employees of private companies for electronic communications with clients ( $Z = -1,786$ ,  $p = ,074$ ).

Also, employees in large companies rated more positively the items related to participation in the electronic public procurement system ( $\chi^2 = 8.469$ ,  $p = 0.014$ ), participation in electronic discussions ( $\chi^2 = 10.290$ ,  $p = 0.006$ ) and the use of public administration services through mobile of devices ( $\chi^2 = 7.786$ ,  $p = 0.020$ ), with respect to SMEs. In general, surveyed business entities use the Internet to a greater extent for accessing e-services ( $AS = 11.32$ ) than for e-participation ( $AS = 5.62$ ).

The remaining research questions relate to the assessment of the most significant advantages (Graph 4) and/or limitations (Graph 5) of the use of electronic services of public administration, from the perspective of business entities.

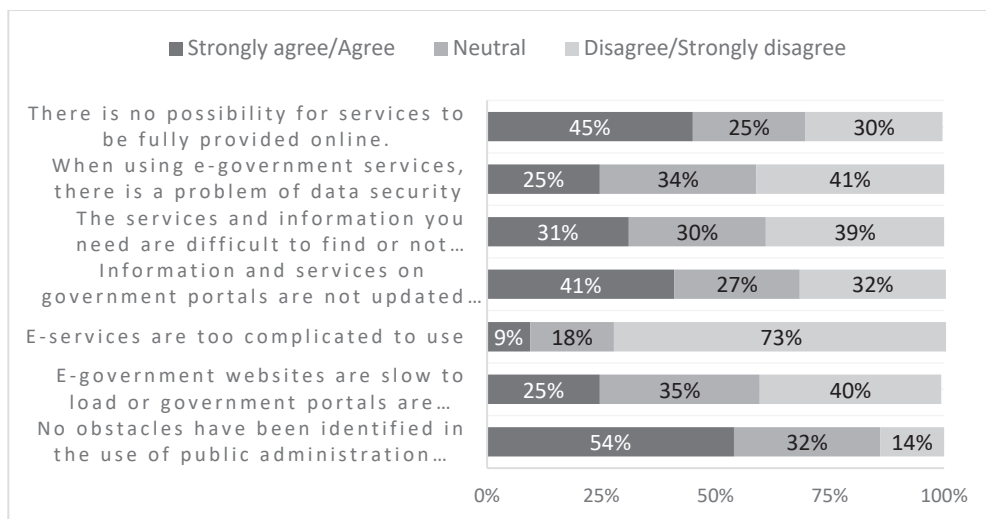


Graph 4. Frequency of responses of the surveyed business entities, indicating the degree of their agreement or disagreement with the statements describing the most significant benefits of using e-government (expressed as a percentage). Note: Respondents were given multiple answers.

The vast majority of businesses are aware of the benefits of the e-government process, benefiting first and foremost in terms of significant savings over time (90% of respondents agree with this statement), then better quality of public administration services for the business sector (80%), savings in money (75%), more transparent government work (72%), and easier access to digital public service (70%). The benefits of using e-government do not depend on the activity, sectoral affiliation or size of the enterprise.

Chart 5. Frequency of responses of the surveyed business entities, indicating the degree of their agreement or disagreement with statements that describe the most significant restrictions on the use of e-government (expressed as a percentage). Note: Respondents were given multiple answers.





Graph 4. Frequency of responses of the surveyed business entities, indicating the degree of their agreement or disagreement with the statements describing the most significant benefits of using e-government (expressed as a percentage). Note: Respondents were given multiple answers.

More than half of the surveyed companies did not find any significant barriers to the use of public administration electronic services (54%), while the majority of businesses did not find e-government services complicated to use (73%). More than a third of respondents disagree (at all or mostly) with the claims that e-government web sites are slow to load (40%), that the services and information needed are difficult to find (39%) or that a security problem arises and data protection (41%). What worries the surveyed businesses is the inability to provide services completely electronically (45%) and irregular updates of information and services on government portals (41%). With regard to the assessment of a series of claims regarding the barriers to the use of e-government, no difference was observed between respondents from public and private sector employees.

## 5. Discussion

Representatives of 83 companies accepted to participate in the survey (out of 488 invited companies), corresponding to a response rate of 17%. This response rate may be considered acceptable, given the results of online research by other authors in the social sciences. According to Johnson [26], who analyzed the level of respondents' expected response to electronic customer satisfaction surveys, email surveys generate a response rate of about 9.3%. This rate has been steadily declining since the 1990s, although the number of studies collecting data electronically has increased [27]. In general, most online surveys have significantly lower response rates than traditional (paper-based) surveys [28]. The conducted research has shown that 80% of economic entities belonging to the segment of the most profitable in the Serbian economy have

used the services of e-government in the last six months, while one fifth of the surveyed companies did not have this type of contact with state administration bodies. In conditions of low level of internet penetration, the policy of encouraging the development of electronic public administration service does not provide satisfactory results. A critical mass of internet users is needed to promote digital services with significant effects [29]. According to the latest SORS (2018) survey on the use of information and communication technologies, 100% of companies in Serbia own an Internet connection and use a computer in their business. Although 99.8% of enterprises use the Internet for business purposes, only half of the surveyed businesses (52%) chose the Internet as the most common channel of communication with public administration. This study has shown that the degree of acceptance of e-government services by the most profitable companies does not depend significantly on the type of ownership, location, size of the business or type of business. One explanation may be the fact that the subjects of analysis are the largest economic entities (by operating income), and accordingly have sufficient resources (in terms of financial resources and human resources) as a support for the adoption of e-government services. Also, the study by Al-Zoubi et al. [30] provides empirical evidence for the existence of a significant relationship between e-government acceptance and business performance. Nevertheless, this question requires further research. Although there is a relatively satisfactory degree of use of e-government services by business entities, they mainly relate to obtaining information and downloading and submitting completed forms in electronic form. This is confirmed by the evaluation of various aspects of the regulatory activity of the Government by economic entities, according to which the availability of information on the websites of state bodies is most favorable, while the administrative burden imposed by regulations is most unfavorable [31]. The results of the survey reveal a gap between the use of e-government services and e-participation in web content forms. Of the companies surveyed, the smallest percentage uses the Internet to participate in interactive discussions on the E-Government Web Portal. Although a public discussion was organized for a third of the laws, the effects of these public discussions are not visible [31]. Almost all surveyed companies are aware of the benefits of introducing e-government. This is first of all significant savings in time and money, then better quality of services and easier access to digital services. These findings are consistent with the results of previous studies addressing e-government user perceptions [32], [33], [34], [35]. It is interesting that the assessment of the most significant advantages, from the point of view of economic entities, also, as well as the level of use of electronic services, does not depend on the activity, sectoral affiliation or size of the enterprise. Analyzing and understanding the factors that encourage or constrain businesses in the use of e-government services is the basis for enacting government measures that provide greater customer support [32]. Therefore, it is also necessary to investigate the problems encountered by enterprises in communicating with state administration bodies through the Internet. The lack of knowledge about e-government programs and services is rated as a "very important" barrier in a range of research [36], [37], [38]. These findings were confirmed in the conducted survey as a major obstacle for the business sector in Serbia, in which the

majority of enterprises (67%) most often state that lack of knowledge of the Government's e-services offerings is the most important reason for not using electronic services, while IT literacy and trust in the use of e-services are not a limiting factor for further development. According to the European Commission [39], lengthy and complicated procedures and incomplete digitization of services continue to limit use by a significant proportion of businesses. However, survey results showed that most businesses do not find e-government services complicated to use (73%). What concerns the surveyed companies is the inability to provide services completely electronically and the irregular updating of information on government portals. Unlike previous studies [40], which highlight the issue of data security/privacy as a significant barrier to e-government adoption, confidentiality and data security do not represent a barrier to the surveyed businesses.

## **6. Conclusion**

The development of e-government is one of the biggest challenges in further modernizing the public administration system. The digitalization of the public sector is conditioned by a number of factors, including technical and technological progress, financial resources and political views. The influence of these factors determines the dynamics and direction of ICT development in the modern information society [34]. The implementation of e-government is particularly complex in the political and economic environment of post-communist countries, which are facing reform of the entire public sector. This study has shown that the largest companies have generally recognized the importance and benefits of the Internet as a way of communicating with the state. Although there is a relatively satisfactory level of use of e-government services, the level of development of electronic services is still lower than expected. There was a need to raise the level of information on e-government services, as well as the need to improve the quality of electronic services, in terms of complete digitization, alignment with the requirements of businesses and regular updating of data. In general, there is considerable room for improvement in this area. Although, at first glance, the problem of misinformation may seem minor in relation to other obstacles, it needs to be given greater attention in the coming period. In order for businesses to fully exploit the potential of e-government, and not just use the services provided by law as mandatory, it is necessary for the Government to promote existing e-services as well as the benefits of using them. More broadly, the implementation of innovation policy, and the support of the Government in this context, is one of the important factors for successful digitization of public services [41]. The results of the research have indicated that information literacy is not a limiting factor in the use of electronic services. However, it should be emphasized that the sample was formed on the basis of the 500 most profitable companies in Serbia, which generate more than half of the income of all companies, so their investment in employee literacy is much more likely. It can be assumed that in order to obtain significantly different results, the focus of the research was on companies with a chronic lack of financial resources [42]. The state administration of the Republic of Serbia faces numerous challenges

today, and one of the most important are the requirements that the European Union places before its potential members, within the framework of the tenth negotiating chapter, in the field of electronic communications and information society services. The success of public sector reform and implementation of e-government, as one of the cornerstones of information society development, depends both on the government and the political will of economic policy-makers and on the degree of acceptance of all potential users (citizens, economy, government employees). Viewed from the perspective of the most successful businesses, they are expected to set an example for other companies and become leaders in adopting new technologies and electronic services of public administration, as they occupy a leading position in the market in terms of revenue generated.

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