A MODEL OF SUCCESS FACTORS FOR E-GOVERNMENT ADOPTION – THE CASE OF POLAND

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ABSTRACT

This research focuses on the possible success factors of e-government in Poland. The purpose of this research was to identify success factors for adopting e-government in this country. The paper continues as follows. Firstly, the paper clarifies the concept of e-government and reviews success factors of e-government proposed by various authors in literature. Secondly, the success factors for adopting e-government in Poland are identified and the model of success factors is proposed. This model embraces the four categories of success factors. They are: economic, socio-cultural, technological and organizational. All the factors are considered in three stages: (1) ICTs access – reflecting technical and economic accessibilities of ICTs, (2) ICTs competences – reflecting competences and awareness related to the use of ICTs, (3) ICTs use – reflecting actual usage of ICTs. The paper concludes with a discussion on research findings, implications, and avenues for further research. This work contributes to extant research by showing a holistic approach to the success factors for adopting e-government, especially in transition economies.

Keywords: E-government, Critical Success Factors (CSFs), Information and Communication Technologies (ICTs)

INTRODUCTION

Creating the information society is an effective strategy to improve competitiveness of countries, regions, enterprises and citizens in the global market. Experts believe that information society is a key determinant of a country's growth e.g. economic growth, poverty reduction and sustainability [8, 32, 57, 12, 70, 85]. The construction of information society is associated with a widespread use of information and communication technologies (ICTs) [66, 36, 38, 39, 30, 62]. Furthermore, ICTs and information revolutionize the way of conducting business, work, study, and establishing relationships between government units, businesses (enterprises), and citizens at the same time [10, 13, 14, 15, 16, 31, 37, 47, 82, 72, 80].

Nowadays the creation of information society has become a priority issue for the transition economies of Central and Eastern Europe. In general, the term transition economy refers to two groups of countries [41]. The first group comprises eight countries that joined the EU on 1 May 2004 (i.e. Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia). Those countries are considered as leaders of the transition process. The second group consists of such countries as Belarus, Bulgaria, Croatia, Georgia, Moldova, Romania, Russia, Serbia, and Ukraine that are still transiting.

The information society is not possible without an effectively operating government and especially without an electronic government (e-government) [35, 42, 84]. E-government is one of several reforms undertaken by public administrations in order to increase the transparency and efficiency of government units and achieve significant cost reductions derived from the use of ICTs [33]. E-government is embedded in combinations of political conditions as well as cultural, technological and organizational changes designed to support and drive a profound transformation in government units [23]. It involves rethinking government organizations and processes, changing behavior, and using ICTs and information to make government services more efficient and easier to access for citizens, businesses and government units [4, 6, 83].

The question asked in literature and practice is: why is the interest in e-government so high on the one hand, but its usage so low on the other [49, 28, 2]. The successful adoption of e-government means successful implementation of ICTs in government units and their successful usage by all government stakeholders, e.g. government employees, citizens and businesses. The adoption of e-government is not straightforward, it requires rather a complex technological, organizational, social, economic and political framework approach (undertaking) [61, 17, 11]. It

requires the coordination of many activities of government units and a close cooperation of employees, managers, IT specialists, as well as citizens and businesses. Additionally, there is a lack of proven scientific theories on and experience in the adoption of e-government in the transition economies of Central and Eastern Europe. Adoption of e-government in transition countries is not considered as successful as their counterparts in developed countries. Transition countries face challenges in making ICTs work over time and institutionalizing them in daily routines within their government units [59, 77, 41]. Among other things, it is very important to identify success factors for successful e-government adoption.

This research focuses on the possible success factors of e-government in Poland. The purpose of this research was to identify success factors for adopting e-government in Poland, which exemplify the "best practices" for the e-government, especially in transition economies in Europe. This paper is structured as follows. Firstly, the paper clarifies the concept of e-government and reviews success factors of e-government proposed by various authors in literature. Secondly, the success factors for adopting e-government in Poland are identified and the model of success factors is proposed. This model embraces the four categories of success factors. They are: economic, socio-cultural, technological and organizational. All the factors are considered in three stages: (1) ICTs access (supply) – reflecting technical and economic accessibilities of ICTs, (2) ICTs competences – reflecting competences and awareness related to the use of ICTs, (3) ICTs use (demand) – reflecting actual usage of ICTs in the government units. The paper concludes by discussing its findings, limitations, implications, and avenues for further research.

This work contributes to extant research by showing a holistic approach to the success factors for adopting e-government, especially in transition economies. Researchers and scholars who develop studies on e-government could find significant guidelines in this paper. Moreover, for practitioners, the results of this study can be used to undertake empirical activities aimed at e-government adoption, ultimately helping them reap more benefits from their activities.

THEORETICAL UNDERPINNINGS

A Brief Introduction to E-Government

The concept of e-government was coined by several researchers and scholars [6, 13, 23, 34, 35, 50, 55, 63, 68, 69, 75, 78, 82, 83, 84]. Furthermore, since 2003 the Gartner Group [9] and the Deloitte [26] have laid the foundations for e-government and have been creating solutions for its development. Moreover, such organizations as: the European Commission [18, 19, 20, 21, 22] OECD [73] and the World Bank [1] are involved in the discourse on e-government.

Generally, e-government has been defined as the application of ICTs to transform the efficiency, effectiveness, transparency and accountability of informational and transactional exchanges within government units, between government units at state and local levels, citizens and businesses; and to empower citizens through access and use of public information and public services. Those researches and works allow to draw the following connotation of e-government. The e-government denotes:
- improving government processes by using ICTs and government process management (e-administration);
- providing government services electronically for citizens, businesses, employees and other stakeholders (e-government services);
- improving transparency and democratic decision making, as well as citizen's participation (e-democracy);
- developing cooperation, networking and partnerships between government units, citizens and business (e-governance).

The holistic understanding of e-government requires careful deliberation on its different issues and for its successful adoption. E-government involves a multidimensional approach embracing the consideration (from the strategic layer to the technical layer) of distinct aspects (organizational, economic, cultural, social, political, and organizational) and the core phases of e-government (from information to personalization level of e-government maturity). Among other things, enumeration of success factors that are crucial for adopting e-government is becoming an important task.

Critical Success Factors for E-Government Adoption

An important challenge is to identify factors that determine the success of e-government adoption. Success factors are these areas and operations which should be focused on primarily in order to achieve the most satisfying results of e-government adoption [83, 84]. The theory of critical success factors (CSFs) [46, 67, 5] gives sound basis for stating what criteria should be followed during e-government adoption.

In the literature there are several definitions of critical success factors for e-government. The UN argued on macro factors as determinants of e-government [45]. It described social, political and economic conditions and a correlation between country's conditions with its level of e-government maturity. In Oyomno' approach, ICT infrastructure development, human resources capability, leadership and management at the organizational level determine the e-government successful adoption [60]. Similarly, Norris, Moon and Reddick defined organizational factors such as website age, size of an organization, manager's professionalism and they have studied the influence of those factors on e-government [65, 56].

Among other factors determining the e-government development are cited: ICT infrastructure development, law and public policy, digital divide, e-literacy, accessibility, trust, privacy, security, transparency, interoperability, records management, permanent availability and preservation, education and marketing, public/private competition/collaboration, workforce issues, cost structures and benchmarking [3]. Marche and McNiven, analyzing factors for e-government adoption, took into account: citizen privacy and security, adequately skilled citizens and government employees, and the elimination of tendency for e-government to replicate traditional government [25, 54]. Those factors were confirmed by Ebrahim and Irani [28]. Moreover, the authors identified such CSFs as ICT infrastructure, organizational, operational cost.

The efforts of the UK government in realizing its e-government target helped to illustrate two perspectives of e-government constraints: a citizens' perspective and a government's perspective [17]. The most important constraints of the citizens' perspective were: lack of internet access, disparities in computer knowledge, generation gap, lack of awareness, language barrier, security fears, lack of trust, un-user-friendly web sites. Regarded as the most important constraints from the government's perspective were: lack of finances, lack of skills and technology, political pressures, data protection and security laws, staff resistance to change.

Other authors classified possible threat sources to e-government into five groups: (1) organizational (i.e. undefined strategy, procedures and regulations, poor leadership, poor security policy), (2) technological (i.e. hardware, software, interface, e-services, e-mail, e-administration), (3) human (i.e. low ICT skill /capability, unawareness, terminated employees, negligent, dishonest, lack of knowledge, culture resistance /seniority, dissatisfaction), (4) natural (i.e. fire, sand/dust storm, lightning), and (5) environmental (i.e. power failure) [71].

ICTs accessibility and quality are positively influencing e-government [64]. Additionally, research is conducted on CSFs influence on - effective IT governance in the government units from developing countries. It is proposed to divide CSTs into four groups. Those are: (1) strategic alignment, (2) value delivery and risk management, (3) resource management, and (4) performance measurement [58].

Culture, as a source of acceptable norms and behaviors, may influence online expectations, preferences, and experiences of individuals and their attitudes towards e-government [79]. A study on the relationship between national culture and e-government were conducted by Kovacic [48]. Kovacic´s study was done from a supply (government's) perspective rather than from a demand (citizens) perspective and used the largest worldwide data sets to test the correlation between culture and e-government readiness. Kovacic found that national culture has a moderate impact on the e-government readiness, although individualism and power distance were the only significant variables. Research in this field was also carried out by Zhao [79]. Unlike Kovacic, he studied the influence of national culture on e-government adoption from both a supply and a demand perspective. Zhao's findings showed that overall, national culture influences e-government development. The countries with a national culture that favors individualism, and/or small power distance, and/or long term orientation perform better in e-government development.

A significant group of CSFs for e-government adoption are social factors. The negative impact of e-government is related to the social exclusion, especially "digital divide" that reflects a state where some groups do not have access to computers and the internet [52]. For example among the causes of digital divide, which simultaneously influence

e-government adoption Asgarkhani identified: lack of telecommunications and network infrastructure; limited PC access; lack of financial resources for developing ICT infrastructure; lack of ICT literacy; limited internet access; cultural resistance; high access costs to global networks and the Internet; high cost of business investment; strategic business impediments – applicability; divides between countries; social divides within countries; divides within countries related to income, education, age, family type, location; business divides related to sector, region, firm size [7]. Except for digital divide, the success of e-government can be influenced by social implications which include: information security, impact on jobs and workplaces, impact on individuals' rights and privacy, potential impact on society, impact on social interaction [7].

The studies on CSFs for successful e-government adoption were also conducted in Central and Eastern Europe. The research showed that higher levels of human capital resources, greater human capabilities and knowledge, rule of law, the availability of ICT infrastructure and more ICT amenities have positive effects on e-government. Whereas, transparency levels (i.e. low corruption perceptions), national wealth and government efficiency are not positively related to e-government adoption [41].

There are several models of CSFs for e-government adoption, some of which are presented above. However, there is a lack of research on this issue in developing European countries. Hence, there is a need to suggest a model that incorporates critical factors contributing to the success in e-government adoption in the transition economies of Central and Eastern Europe.

RESEARCH METHODOLOGY

This study is a part of research on the holistic and systems approach to the sustainable information society [81]. One of the areas identified for future research relates to critical success factors for sustainable information society development. At the same time, the key nexus in the sustainable information society is a well-functioning public administration and an e-government in particular [86]. Among others, the following research question was posed:

RQ: Which areas and operations of government units should be primarily focused on in order to achieve the most satisfying results of transition from a government to an e-government? [81].

Consequently, this study sought to examine critical factors for successful e-government adoption. This was a complex issue and it required research tasks of cognitive, conceptual and methodological characteristics. Such a spectrum of work involved adaptation of research methods to specific individual tasks and required the use of various research tools. These were: a critical review of literature, action research [29, 51], brainstorming [76], the Delphi technique [53, 24, 40] and logical deduction.

The general purposes of a literature review were to critically appraise and synthesize the current state of knowledge relating to the CSFs for e-government adoption and identify gaps in this knowledge that a new study would seek to address. The aim of action research was to find CSFs for e-government adoption in Poland that is to find "a solution to a local problem in a local setting" [29, 51]. Action research means the collaboration of this paper authors with the Silesian Centre of Information Society (SCSI). The SCSI is responsible for information society development, as well as e-government, in the Silesian Voivodeship, Poland. Brainstorming was used in the middle stage of CSFs model development, when new ideas and solutions of the CSFs model were required. Whereas, the Delphi technique was employed for gathering knowledge on CSFs from respondents within their domain of expertise and for verifying and developing the model of success factors. For the purpose of delving deeply into the practical value of this model, this study adopted action research and the Delphi technique.

In order to propose a model of success factors for e-government adoption this research took the following stages. Firstly, a review of literature was conducted to identify CSFs for e-government adoption presented in the literature. Secondly, basing on literature findings, empirical observations concerning e-government adoption in the Silesian Voivodeship and brainstorming of the paper authors, this study established a prototype model of success factors for e-government. Thirdly, thanks to the Delphi technique this model was verified and developed. The Delphi process was iterated until consensus on success factors for e-government adoption has been achieved.

21 experts participated in the Delphi study. The selection of experts was made in such a manner as to combine knowledge and experience of scholars, researchers and practitioners. The experts were (Table 1):

- employees of local and state government (16), who are responsible for ICTs and e-government adoption; and
- professors of Polish universities (6), who conduct studies and empirical research on information society and e-government.

The Delhi study employed multiple iterations designed to develop a consensus of opinion concerning CSFs for e-government adoption. The process was viewed as a series of rounds. In the early rounds four experts participated, in the last round all experts listed in Table 1 participated in the Delphi research. In each round every expert dealt with and felt out a questionnaire which was delivered to a researcher who gathered, organized, and gave back to every expert an account of the standpoint of the whole group and the expert's own opinion. A summary of opinions expressed by each expert made them aware of the range of positions and the reasons underlying those positions. In the last round the experts evaluated the strength of influence of particular factors on e-government adoption. A Likert scale was used in the evaluation. The experts had to answer the question: In a scale 1 – 5 state to what extend do you agree that the following factors influence the development of e-government? The scale respectively represented: 1 – disagree strongly, 2 – disagree, 3 – neither agree nor disagree, 4 – agree, 5 – agree strongly.

Table 1. Delphi study experts

No.	Title	Government sector	Government unit
1.	Minister Counselor	State government	The Ministry of Administration and Digitization
2.	Deputy Director for European Affairs	State government	Centre for Health Information Systems
3.	Director	State government	Central Statistical Office, Szczecin
4.	IT Team Manager	Local government	Marshal's Office Silesian Voivodeship
5.	SEKAP Project Coordinator	Local government	Marshal's Office Silesian Voivodeship
6.	Deputy Director	Local government	Silesian Center for the Information Society
7.	Design and Development of E-government Services Specialist	Local government	Silesian Center for the Information Society
8.	Head of IT Department	Local government	Dąbrowa Górnicza City Hall
9.	Head of IT Department	Local government	Jaworzno City Hall
10.	Junior Inspector of IT Department	Local government	Jaworzno City Hall
11.	Chief Specialist - coordinator of office IT services	Local government	Kalisz City Hall
12.	Head of IT Department	Local government	Katowice City Hall
13.	Representative of the President for the Promotion of Innovativeness	Local government	Katowice City Hall
14.	IT Team Manager	Local government	Mysłowice City Hall
15.	Head of IT Department	Local government	Zawiercie District Office
16.	Inspector of Information Technology and Telecommunications	Local government	Żywiec City Hall
17.	Professor	Univeristy	Warsaw School of Economics
18.	Professor	Univeristy	Warsaw School of Economics
19.	Professor	Univeristy	Poznan University of Economics
20.	Professor	Univeristy	University of Economics in Katowice
21.	Professor	Univeristy	University of Economics in Katowice
22.	Professor	Univeristy	University of Economics in Katowice

RESEARCH FINDINGS

Perspectives of Success Factors for E-Government Adoption

The conducted research has allowed to indicate several factors of success for e-government adoption. These factors play different roles in the e-government adoption, from great to small importance. They are of different characteristics related to ICTs supply and demand as well as e-government stakeholders and their ICTs competences. ICTs mean hardware (computers, networks, mobile phones) and software (back-office and front-office information systems, e-government service, websites). In this briefing note, Government-to-Citizens (G2C) and

Government-to-Business (G2B) services are categorized as front-office, and Government-to-Government (G2G) as back-office. ICTs themselves would not guarantee success with e-government. It is necessary that any e-government initiative must ensure that it has sufficient resources, adequate ICT infrastructure, management support, capable ICT staff, and effective ICT training and support, coordination and management of e-government, as well as e-government stakeholders' competences related to use of the ICTs potential.

Empirical data suggest that the adoption of e-government is conditioned by many factors of economic, social-cultural, technological and organizational characteristics. Firstly, there is a positive relationship between economic factors and e-government adoption. The economic factors are related to the national wealth, the economic well-being of nation, the financial situation of government stakeholders, the availability of economic endowments, risks of failure of adopting e-government as well as the economic benefits. Secondly, socio-cultural factors positively influence the adoption of e-government. The Delphi study experts have also shown the existence of a positive relationship between the mentality and awareness of e-government stakeholders, digital divide, information culture, digital culture and the e-government adoption. Thirdly, technological characteristics positively influence the adoption of e-government. These factors are related to ICTs innovations, innovative e-government services, open source software licenses, integration of front-office and back-office information systems, user-friendly information systems, maturity of e-government, ICT standardization, competitive ICT professionals, and quality of e-government services. Fourthly, the experts have indicated that the e-government adoption depends on organizational factors, such as rule of law, managerial innovation, and management of ICTs.

Furthermore, empirical data suggests that e-government adoption requires:
- technical and economic accessibilities of ICTs – ICTs access (supply) stage;
- competences and awareness related to the use of ICTs – ICTs competences and awareness stage; and
- usage of ICTs by government units, citizens and businesses – ICTs use (demand) stage.

Consistent with the tenets espoused in our early research on information society and these research findings, the success factors model for e-government adoption is presented in Figure 1. It is designed to highlight the relationships between relevant factors and the dependent variable – e-government adoption.
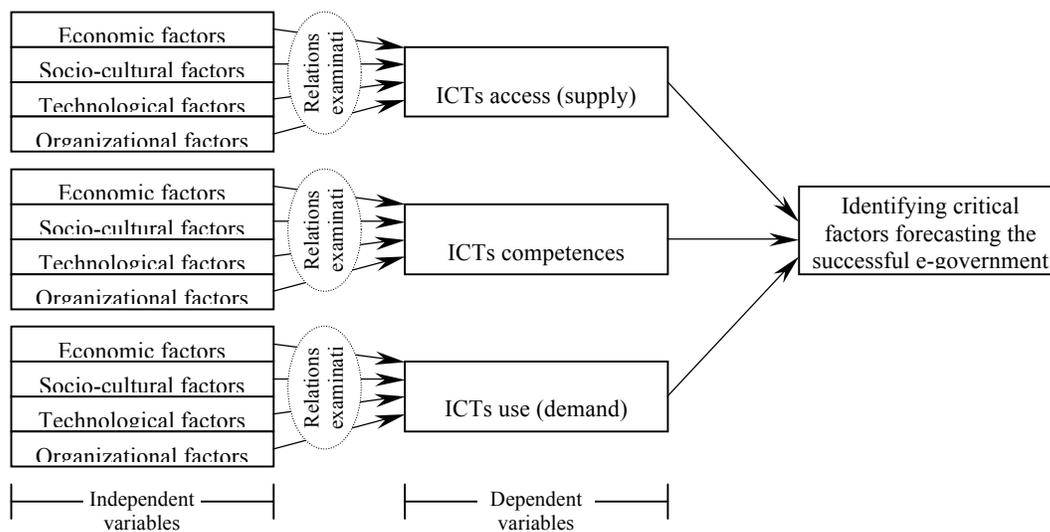
Figure 1. Proposed conceptual model of success factors for e-government adoption

Economic Factors Related to E-Government Adoption

Some economic factors are related to successful adoption of e-government as shown in Table 2. The public and private financial outlays on ICTs are of paramount importance among them. This includes both investments in

computers, networking and telephony, as well as back-office information systems, front-office information and e-government services, in particular. No less important for e-government adoption are the financial situation of government units and the associated possibility of financing the purchase, implementation and maintenance of ICTs. Very important are also public and private funding of education in ICT for government managers and other employees. Outlays on the creation of centers of ICTs competence in public administration were also mentioned as an important economic success factor, which may take the form of databases of knowledge, ideas and concepts, forums, portals and online counseling. In the countries of Central and East Europe investments related to the implementation of e-government are often financed with European Union founds. The sources of public grants and subsidies are: Regional Operational Programmes and Operational Programme "Innovative Economy" financed from the European Regional Development Fund as well as the Operational Programme "Human Capital" financed from the European Social Fund. Private outlays are firms' outlays, for example, to build a network or personal expenses, such as education. According to experts, the least important economic factor influencing e-government adoption is the economic risk.

Table 2. Economic success factors for adopting e-government

Stages	Critical success factors	Influence				
		5	4	3	2	1
ICTs access (supply)	Public subsidies and private outlays on hardware, networks and telecommunications	17	5			
	Competition on ICT market	6	12	2	2	
	Public outlays on back-office and front-office information systems, especially e-government services	16	3	2	1	
	Financial situation of government units	14	4	2	2	
ICTs competences	Public and private outlays on ICTs education for government managers	9	13			
	Public and private outlays on ICTs education for government employees	6	15	1		
	Outlays on creating ICT competence centers government units	9	7	3	3	
ICTs use (demand)	Financial situation of government units	14	4	2	2	
	Potential economic benefic coming from ICTs usage in government units	8	8	2	4	
	Economic risk of ICTs implementation in government units	1	5	7	6	1
	Public outlays on ICTs promotion in government units	6	7	5	3	

(Leftmost spanning label: Economic perspective)

Socio-Cultural Factors Related to E-Government Adoption

The socio-cultural transition leads to successful implementation of e-government. The detailed results of the identified socio-cultural factors are presented in Table 3. ICTs awareness of government officials (managerial workers) is an important factor. Managers can minimize or recognize the role of ICTs in public administration, which, to a very large extend, influences decision-making on investment and the use of ICTs. Another, according to experts, very important and an important success factor is the absorption of e-government services through e-government stakeholders. For example, the reported demand for e-government services by government stakeholders and extensive use of already provided e-government services both bear a very positive effect on e-government. Experts point to a culture of information conducive to the use of ICTs as a success factor for e-government adoption. It is mainly about a new culture of work with information and ICTs, operating in multicultural environments, building trust, building relationships and networks, sharing knowledge. Information culture can be expressed through the use of electronic document management system and electronic signature, the involvement of government employees in the process of defining requirements for information systems and the testing process. A manifestation of this culture is the shared responsibility for the implementation of information systems, the integration of government stakeholders, building trust in e-government services, encouraging (by government employees) citizens and businesses to electronic forms of contact with the government units, cooperation between government units. New social and cultural competences of government employees are very important to create such an information culture. The smallest impact on the development of e-government bears social exclusion.

Table 3. Socio-cultural success factors for adopting e-government

	Stages	Critical success factors	Influence				
			5	4	3	2	1
Socio-cultural perspective	ICTs access (supply)	ICTs awareness of managerial workers in government units	15	5	1		
		Public e-services absorption by stakeholders of government units	11	9	1		
	ICTs competences	Incentive system promoting permanent competence improvement of government employees (especially in ICT)	7	9	2	1	2
		ICT External experts consultancy for government units in the field of ICT	4	11	4	1	2
		New social and cultural competences of government employees	7	9	5	1	
	ICTs use (demand)	Information culture in government units conducive to the use of ICT	14	8			
		Social exclusion of workers, citizens, entrepreneurs due to age		3	7	4	8
		Social exclusion of workers, citizens, entrepreneurs due to education		1	7	7	7
		Social exclusion of workers, citizens, entrepreneurs due to place of residence		3	5	7	7
		Social exclusion of workers, citizens, entrepreneurs due to disability	1	3	5	5	7

Technological Factors Related to E-Government Adoption

This research confirmed that there is a significant association between technological factors and e-government adoption. Quality of front-office and back-office systems is one of the most significant factors, especially quality of e-government services. Attention has been paid to the following quality standards: functionality, reliability, usability, efficiency, maintainability and portability [43, 44]. In the opinion of experts e-government adoption is strongly influenced by the maturity of e-government services [74, 27, 84]. E-government services at the 4th level of maturity, called transaction (full electronic) and at the 5th level called personalization (targetisation/automation) [83] determine e-government adoption. It needs to be stressed that the highest levels of maturity require architecture interoperability [83]. Important success factors are innovative ICTs, e.g. broadband and next generation access networks (NGA/NGN), mobile devices, innovative e-government services, government process management systems. ICTs leaderships and ICTs visionaries, and high ICTs competence of government employees have profound influence on e-government implementation. The all identified technological success factors are positively related to e-government adoption are presented in Table 4.

Table 4. Technological success factors for adopting e-government

	Stages	Critical success factors	Influence				
			5	4	3	2	1
Technological perspective	ICTs access (supply)	Innovative hardware and networks in government units	12	6	2	2	
		Innovative e-government services	18	1	2	1	
		Open source software licenses	6	7	9		
		Standardized ICTs for government units	9	10	1	1	
		Dedicated (personalized) ICTs for government units	10	8	2	1	
		Coopetition on ICT market	3	3	10	4	
	ICTs competences	ICT leaderships and visionaries in government units	13	7	2		
		ICT competences of government employees	14	7		1	
	ICTs use (demand)	Integration of front-office and back-office information systems	15	6	1		
		Quality of e-government services	20	1		1	

		5	4	3	2	1
	Maturity of e-government services	15	4			

Organizational Factors Related to E-Government Adoption

The most important factors for e-government adoption are related to organizational factors. The resulting set of these factors is given in Table 5. It is reasonable to expect that where e-government leaderships (visionaries) to drive e-government initiatives exist, there will be little or no problems in adopting e-government. Moreover, coordination of public ICT investments and top management support were identified as major factors. Several experts highlighted that electronic communication between government units (G2G model) [11] and adaptation of new management models in government units positively influences the adoption of e-government. These new models are: knowledge management, government processes management, electronic document management, workflow management. E-government adoption is determined by the rule of law. Here are listed legal regulations mainly concerning intellectual property, digital signatures, data protection, public procurement, interoperability, electoral law.

Table 5. Organizational success factors for adopting e-government

	Stages	Critical success factors	Influence				
			5	4	3	2	1
Organizational perspective	**ICTs access (supply)**	Coordination of public ICT investments	12	6		3	
		Public-Private Partnership in the field of ICTs	1	9	10	1	1
		Rule of law	9	7	3	2	
		Institutional support for the development of ICT infrastructure	8	7	5	2	
		Access for employees of government units to their network resources	5	4	5	5	1
		ICT benchmarking for local and state government	2	10	6	2	1
		Approved e-government strategy	7	10	3	2	
	ICTs competences	E-government leaderships and visionaries	13	7	2		
		The competence of employees of government units in the field of new management models	7	9	5	1	
		ICT benchmarking for local and state government	2	10	6	2	1
		Approved e-government strategy	7	10	3	2	
	ICTs use (demand)	Top management support	12	6		3	
		Adaptation of new management models in government units	9	11	1		
		Participation of employees of government units in organizational changes	4	10	3	2	2
		Electronic communication between government units	14	8			
		New ways of providing work by employees of government units	3	8	9	1	

DISCUSSION

The research findings have several implications for e-government practitioners, or those involved in e-government projects.

Adoption of e-government requires: (1) technical and economic accessibilities of ICTs – ICTs access (supply), (2) competences and awareness related to the use of ICTs – ICTs competences, and (3) usage of ICTs by government units, citizens and businesses – ICTs usage (demand). Our studies and experiences confirmed there is some gap between the supply of ICTs in government units (e-government) and actual usage of ICTs (e-government). ICTs access means ICT infrastructure investments in government units. This concerns in particular the purchase of hardware, construction of infrastructure networks and the implementation of the standard or creation of the dedicated back-office and front-office information systems. ICTs investments in themselves do not mean success in adopting e-government. They must involve a variety of organizational, social and cultural changes that lead to

improvement of efficiency, transparency, and accountability in government units by reducing transaction times and removing redundant layers of bureaucracy. Lack of relevant changes, such as re-engineering of government processes and documents workflows or adaptation of the law, usually means that the implementation of ICTs does not bring the expected benefits. Low quality and lack of integration of information systems and their lack of adaptation to the needs of users can be even a cause of failure to use ICTs. In particular, this relates to the e-government services for citizens and businesses. Thus, in addition to ICTs supply, the adopting e-government is also determined by ICTs demand. Competences of government managers and employees are very important for these two stages. Their knowledge and skills are needed to take appropriate investment decisions, implement ICTs and successfully use ICTs..

In sum, there are four groups of factors that government leaders should consider in successful adopting e-government at the three above stages. Firstly, a long-term economic plan with a clearly articulated financial strategy of ICTs supply, competences and usage funded by the government, the European Union and businesses (public-private partnership) is vital to the adoption of e-government. Successful e-government adoption requires financing of not only ICTs investments, but also ICTs usage and ICTs competence improvement. Secondly, socio-cultural factors influence the adoption of e-government. This research provides evidence in support of the positive, direct associations between e-government adoption and information culture, awareness government stakeholders of a given e-government or of its benefits as well as new stakeholders competences focused on information. Thirdly, adoption of e-government is determined by technological factors. Innovative ICTs, e-government services at the highest level of maturity, very good-quality e-government services and integration of front- and back-office information systems enhance the exponential adoption of e-government. Moreover, ICT leaderships and visionaries in government units and their high ICT competences spur on-going efforts to adopt e-government. Fourthly, organizational requirements are necessary for the adoption of e-government. Coordination of public ICT investments and top management support, implementation of new management models and rule of law create favorable conditions for e-government adoption.

The identifying and understanding success factors of e-government bear significance for reliable and effective e-government adoption. The most important challenge to overcome in this respect is to realize that there is no one solution to fit every situation. European countries are characterized by vastly different political, economic, social and governance contexts, which require different approaches. Proposed model is easy to adjust quickly to the new conditions.

CONCLUSIONS

Generally speaking, the adoption of e-government poses a challenge, and thus is an interesting subject of research. This research puts an effort to make some contribution to the development of studies on e-government, especially on CSFs for successful e-government adoption. It explores e-government concept, investigates CSFs for e-government by reviewing the literature, identifies a comprehensive set of CSFs by action research, brainstorming and the Delhi study. Finally, it proposes the model of CSFs. We employed experts from15 local and state governments and 6 Polish universities to provide insight. The research findings showed that economic, socio-cultural, technological and organizational factors (e.g. national wealth, human capital, ICT infrastructure, rule of law, organizational changes, leaderships support) matter in accelerating country's ability and willingness to implement e-government successfully.

Those identified CSFs are not unique to the e-government in Poland. They are universally applicable to a general e-government in any country. The proposed model can be definitely useful for transition economies, especially in Central and East Europe. Government practitioners could find answers to an important question: which areas and operations of government units should be primarily focused on in order to achieve the most satisfying results of transforming from government to e-government. This research suggests important issues for programming, building and developing the e-government. The replication of this study in emerging and developing countries will be useful to improve their knowledge related to the factors impacting e-government adoption (or lack thereof) in such contexts.

The model of success factors for e-government adoption showed in this research should be explored in greater depth. By focusing on longitudinal research and expanding the number of local government units that will be

studied, the authors hope to evaluate this model and identify the barriers and facilitators of e-government adoption in Poland. Moreover, ranks of the identified CSFs will be examined. All these factors will be prioritized in different contexts, for instance, economic, socio-cultural, organizational, technological, ICT access, ICT competences, and ICT use. This research is and will continue to be conducted in the next months. Furthermore, there is also a need to conduct more in-depth research on e-government, especially into: (1) improving government processes by using government process management and ERP systems, (2) providing e-government services at the highest level of maturity, (3) exploring "best practices" to be used to successfully adopt e-government, and (4) investigating "demand-side" of e-government from the viewpoint of citizens and businesses view. Those will be considered as future work.

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