

Association for Information Systems

AIS Electronic Library (AISeL)

GlobDev 2021

Proceedings Annual Workshop of the AIS
Special Interest Group for ICT in Global
Development

12-12-2021

Driving Forces in Enterprise Systems Implementation in the Public Sector: A Conceptual Framework

Narczyz Roztocki

Kozminski University, roztocki@kozminski.edu.pl

Wojciech Strzelczyk

Kozminski University

Heinz Roland Weistroffer

Virginia Commonwealth University

Follow this and additional works at: <https://aisel.aisnet.org/globdev2021>

Recommended Citation

Roztocki, Narczyz; Strzelczyk, Wojciech; and Weistroffer, Heinz Roland, "Driving Forces in Enterprise Systems Implementation in the Public Sector: A Conceptual Framework" (2021). *GlobDev 2021*. 5. <https://aisel.aisnet.org/globdev2021/5>

This material is brought to you by the Proceedings Annual Workshop of the AIS Special Interest Group for ICT in Global Development at AIS Electronic Library (AISeL). It has been accepted for inclusion in GlobDev 2021 by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Driving Forces in Enterprise Systems Implementation in the Public Sector: A Conceptual Framework

Narczyz Roztocki^{a*}, Wojciech Strzelczyk^a and Heinz Roland Weistroffer^b

^a Department of Accounting, Kozminski University, Warsaw, Poland; ^b School of Business, Virginia Commonwealth University, Richmond, VA, USA

*Corresponding author: Narczyz Roztocki, E-mail: roztocki@kozminski.edu.pl, Department of Accounting, Kozminski University, 57/59 Jagiellonska Street, 03-301, Warsaw, Poland

Paper Category: Research-in-progress

ABSTRACT

The objective of this paper is to gain a better understanding of the driving forces in enterprise systems (ES) implementation in the public sector by providing a conceptual framework that illustrates these driving forces and their interrelationships. ES in the public sector may improve operational efficiency, provide more timely access to data for public decision makers, lead to more and better information for the community, and thus may have a substantial impact on socio-economic development. Though there has been much research on ES implementation in the private sector, the findings from the private sector do not always carry over to public organizations, which differ substantially from private companies in external regulations, available resources, and internal culture. The data in this multi-case study were collected in semi-structured interviews of City Hall employees in Poland, representing diverse levels of experience and authority. Based on these data, we identify six key concepts in ES public sector implementations and propose a conceptual framework to serve as guidance for future ES implementation projects in the public sector as well as provide a foundation for future research.

Keywords: Enterprise systems, ES, enterprise resource planning, ERP, driving forces, public sector, socio-economic development

INTRODUCTION

Enterprise systems (ES) are complex application software packages designed to support multiple functional areas of an organization and allow for comprehensive integration of organizational

data. ES may greatly benefit an organization by reducing transaction costs, increasing efficiency and effectiveness, while leading to improved customer or client satisfaction (Chou & Chang, 2008). However, due to their complexity, ES implementations are costly, time-consuming, and risky endeavors and many ES implementations have fallen short of providing the expected benefits, or vastly exceeded the projected budget and delivery time.

This uncertainty, together with the significance of ES for modern organizations, has resulted in ES implementations to receive much attention in academic research. However, most of this research has focused on the private rather than the public sector.

The public sector is an important (Fernandez et al., 2017) component in the economy, as its mission is to serve citizens by providing societal infrastructure. This includes legislative bodies, police and military services, public healthcare, public education, and public transportation. In essence, public sector organizations are organizations that serve the public purpose.

For over two decades, many organizations in the public sector have been adopting ES (Thomas & Jajodia, 2004), which in many cases have led to improved operational efficiency, better and more timely access to data for public decision makers, and more reliable information for the wider community, thus substantially impacting socio-economic development. ES also constitute an important platform for electronic government (Wagner & Antonucci, 2009), defined as the use of various information technologies to provide government services (Carter & Belanger, 2005). Electronic government (or e-government) can advance socio-economic development by furthering increased transparency and thus reducing corruption, and by facilitating a higher level of political control over public administration (Gronlund & Horan, 2005).

However, there is a scarcity of research on ES focusing specifically on the public sector, and the existent reports are fragmented, incomplete, and inconsistent. In particular, very little is known about the driving forces related to ES implementations. This lack of a reliable body of knowledge to back ES implementations in the public sector provides the motivation of our research.

Research findings from the private sector cannot always be transferred to the public sector (Kumar et al., 2002). One very important difference between the public and private sectors is the availability of resources and their disposal options, as the private sector is less restricted and less regulated in acquiring and spending financial resources. In addition, in the public sector, larger

information systems, such as ES, are acquired through public tender, and preparing a public tender requires specifying the system needs in detail, leaving less flexibility in the implementation process.

Another feature which differentiates many public agencies both on a local and national level from private organizations is a complex organizational structure with disconnected responsibilities and rigid requirements established by broad regulations and internal authorities. All these factors severely limit implementations of ES to follow typical commercial solutions, and the critical success factors for ES implementations in the public sector may differ significantly from the critical success factors for ES implementations in the private sector.

To address this research gap, our main objective in the current research is to identify the most important driving forces that affect ES implementations in the public sector, where driving forces are defined as any factors that provide impetus behind the processes and decisions that bring about the ES realization. To this end, we pose the following research question:

What driving forces (or concepts) are instrumental in the implementation of an enterprise system in the public sector and what are the relationships between these driving forces?

To answer our research question, we use an exploratory case study approach. Data collection is via semi-structured interviews and archival document analysis. The results from six organizations in the public sector are then used to construct a conceptual framework, to help organize our observations and show relationships between various factors.

The rest of this paper is structured as follows. The next section presents background information on ES in the public sector, including a working definition of the public sector, as well as a brief review of the current landscape of ES research in the public sector. Following this, we describe our research approach. Then, after presenting and discussing the results of our investigation, we propose a conceptual framework, which discerns the most important factors that may drive ES implementations in the public sector. We conclude our paper by summarizing our contribution to the existing body of knowledge and proposing several promising avenues for future research.

BACKGROUND

Enterprise Systems

Enterprise systems (ES) are complex application software packages that support the operation of the whole enterprise and integrate multiple functional areas. Frequently, the terms Enterprise Resource Planning (ERP) systems and ES are used interchangeably, however ES more generally refers to large enterprise-wide systems, including ERP systems as well as CRM (customer relationship management) and SCM (supplier change management) systems along other large integrated systems.

Essentially, an ES is a comprehensive database that collects, stores, and provides data across the whole organization (Davenport, 1998). The main advantage of this enterprise-wide database approach is that data needs to be entered only once and can be retrieved and used across various functional departments and business units, including, for example, data provided to managers for organizational decision making (Bingi et al., 1999).

Since the 1990s, ES have increasingly been employed as replacements for various department specific legacy systems (Holland & Light, 1999). ES consist of multiple modules, such as financials, human resources, operations and logistics, sales, and marketing (Davenport, 1998), and can be tailored to accommodate the specific needs of a given organization (Esteves & Pastor, 2001). ES allow for the seamless integration of all information flows in an organization, such as financial and accounting information, human resource information, supply chain information, and customer information (Davenport, 1998). Ideally, implementation of an ES will allow an organization to reduce transaction costs and improve productivity and client satisfaction (Beheshti & Beheshti, 2010; Tsai et al., 2010).

Notwithstanding its potential, ES implementations are highly risky projects and frequently exceed schedules and budgets (Parr & Shanks, 2000). Implementation of an ES is a big effort that puts much strain on the organization (Koch & Mitlöhner, 2010; Zeng & Skibniewski, 2013), and though many ES implementation projects start with great expectations, they often do not meet these expectations. Qu et al. (2014) suggest that ES implementations may improve organizational flexibility but have a negative effect on process flexibility. While many enterprises have experienced substantial improvements in their operations and an increase in

productivity, there have also been many less than successful implementations that, in some cases, have led to the total abandonment of the system and even to bankruptcy (McNurlin & Sprague, 2002). Some authors estimate that the failure rate for ES projects ranges from 40 to 60 percent (Liang et al., 2007).

Thus, considering the potentially great benefits of ES adoption together with the high risk involved, it is not surprising that ES implementation has attracted much attention by academic researchers. However, most of this research has been conducted in the context of the private sector, whereas published research on ES in the public sector is comparatively scarce.

Public Sector

The public (or state) sector consists of public services and public owned enterprises. Public services may include national defense, law enforcement, public transportation, public education, public health care, and physical infrastructure, such as public roads, water supply, electrical grids, and telecommunications, as well as administration, i.e., government itself. Many public services are available to and benefit all of society rather than just a small number of individuals that pay for these services. Public owned enterprises are state or community owned organizations, but different from public services, they are largely self-financing and operate much like private sector businesses, though often with more government regulation.

Organizations that are not part of the public sector are either part of the private sector or the voluntary sector. The private sector is composed of organizations that are mainly intended to earn a profit for their owners and are expected to compete effectively in the market. The voluntary sector consists of non-governmental, not-for-profit groups and organizations that provide specific services to sections of society, and includes charitable organizations, non-profit private schools and universities, non-profit private hospitals, etc.

Rainey et al. (1976) point to the differences in the external environments of the public and the private sectors. These include less exposure to the market, more legal and communal constraints, and strong political influences for organizations in the public sector. Public sector organizations are also faced with definite expectations, as the general populace expects more accountability, fairness, honesty, and responsiveness (Rainey et al., 1976).

Since many of the organizations in the public sector are fully or partially financed by tax revenues, they generally undergo considerable scrutiny from the community. In general, managers in the public sector have less flexibility in hiring, reassigning, and removing employees. They also have less discretion in setting compensation level of their employees.

Because of public scrutiny and the highly regulated organizational environment in the public sector, not following proper or approved procedures may lead to disciplinary or even criminal penalties. However, success in a public sector organization is likely to only result in relatively modest rewards for the responsible actors. Thus, it may be expected that managers in the public sector are more risk averse than managers in the private sector.

Enterprise Systems Implementations in the Public Sector

As stated earlier, published research on ES in the public sector is relatively scarce (Alves & Matos, 2013). However, the modest existing repository of literature dealing with ES in the public sector indicates that there are significant differences between ES implementations in the public sector and in the private sector. Since ES in the public sector commonly require public tender, specifics of the desired system need to be documented in advance. Thus, organizations in the public sector do not have the luxury to start the implementation project with only rough planning, and then adjust expectations and resource allocations as needed with the progress of the project. The whole public tender is under public scrutiny, and vendor selection must be thoroughly documented. Public sector organizations are generally limited to using only vendors that participated in the public tender, limiting choices.

ES implementation projects are also affected by the specific culture in public sector organizations (Kumar et al., 2002), as employees in the public sector have different expectations and viewpoints regarding organizational commitment, incentives and job satisfaction, and business processes. Blick, Gullledge, and Sommer (2000) state that small business teams that are focused on meeting business process requirements are central to the organizational structure in the public sector.

One main motivation for implementing ES in the private sector is maintaining competitive advantage (Zmud et al., 2004), however, in the public sector, competitive advantage is of less concern. Frequently, in the public sector, ES are implemented for primarily technical reasons and are viewed as technology-driven projects (Kumar et al., 2002). Based on public data of 46

accounts on ERP implementations in the public sector, Raymond, Uwizeyemungu, and Bergerone (2006) investigated what motivates public sector organizations to adopt this technology. The results of their study indicate that public sector organizations implementing ERP systems fall into three categories: those primarily motivated by improving process efficiency, those motivated by integrating diverse existing technologies, and those driven by strategic perspectives.

Several authors agree that top management support, effective project and change management, clear goals and missions, sound knowledge and competences within project teams, effective communication, and solid training enable successful ES implementation (Al-Harhi & Saudagar, 2020; Ziemba & Oblak, 2013). However the study by Seres et al. (2019) points out the difference in importance of these factors in the public sector as compared to the private sector.

There is disagreement as to the significance of re-engineering of business processes, where Allen et al. (2002) claim it to be a key factor, while Al-Harhi and Saudagar (2020) found it to have only modest or non-existent impact. The importance of vendor support is also contended, with Al-Harhi and Saudagar (2020) and Bukamal and Abu Wadi (2016) proclaiming it a critical success factor that notably affects ES implementation, while a previous study by Crisostomo (2008) did not find any significant relationship between vendor involvement and ES implementation success. Sommer (2011), investigating the role of middle management in public ERP implementations, surmises that one of the reasons that many ERP implementations do not result in the expected improvements to the bottom line is due to the requirement for consensus-based decision-making and the lack of individual decision-making authority by managers in the public sector. Sommer asserts that the role of middle management is much more critical to the success of public sector ERP implementations than in corresponding private sector efforts. Sommer also found that public sector project managers at all levels seem to be quite unprepared to deal with the complexities of ERP and do not fully understand the close association between the underlying business process architecture and the business transactions executed by the software.

Despite many past studies having focused on identifying critical success factors of ES implementation, no consensus has been reached, and further research in this area is called for. Also, not much research has been published specifically on the driving forces that may affect ES

implementations in public organizations, as opposed to critical success factors. Al-Harthi and Saudagar (2020), among others, suggest to also direct further research toward investigating the interrelations among drivers affecting ES implementation.

METHODOLOGY

As the main methodology of this research, we followed a case study approach. As recommended by Yin (2014), we used multiple sources of evidence, viz interview transcripts and archival documents. Case study research focuses on understanding the dynamics of processes (Eisenhardt, 1989), such as in ES implementations, and is particularly useful in developing theory. Since our objective is to build a conceptual framework, the multiple case study approach seems particularly suitable, as it allows for wider exploration of the research questions than a single case study. An important driving force identified in one case, and then confirmed in other cases, provides for a stronger empirical grounding in the construction of our conceptual framework. Our research question guided us to approach specific organizations in the public sector that had implemented or were in the process of implementing ES. Figure 1 summarizes the main phases of our study.

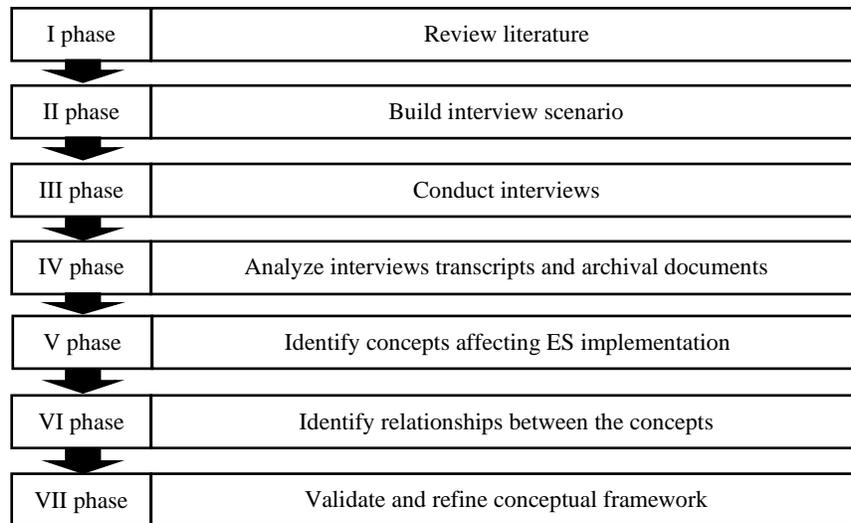


Figure 1. Research Phases

The first phase of our research project consisted of reviewing the existing literature for relevant concepts or driving forces in the implementation of ES systems in the public sector.

In the second phase we build an interview scenario and prepared a set of questions. The intention of these questions was to confirm or disprove the validity of concepts identified from the existing literature and possibly identify additional influential factors or drivers. The interview questions were designed to correspond to the information sought for answering our research question. Thus, the main directions of the interview questions deal with identification of drivers in ES implementations and their interrelationships, as well as good implementation practices, perceived by the interviewees as significant to a successful ES launch. The list of interview questions is included in Appendix 1.

The third phase was our primary data collection. In May 2019 we conducted a pilot study in one of the City Halls (or City Administration Offices/in Polish: *Urzeddy miasta*) in Poland, which had implemented a large ES several years prior to our study and agreed to participate in our research. During the pilot study, we conducted and recorded 11 interviews. The pilot study confirmed that our question set was well designed and only minor changes were needed. We also used the experience gained from the pilot study to refine our research strategy and decided to contact five additional City Halls.

In the following three months, between June and August 2019, we conducted and recorded a total of 27 additional interviews in four City Halls in Poland. We intended to conduct interviews with only one person at a time, however on one occasion, as we were interviewing one person, another employee working at the same City Hall spontaneously joined in the conversation and interview process. Thus, one of the 27 interviews conducted in the four additional City Halls included two interviewees. In total, 27 interviews in four City Halls provided input from 28 employees.

In the fifth City Hall that we contacted, the IT managers were concerned with our recording of the interviews, however they expressed support for our research and asked us to provide them with written questionnaires including all our interview questions. They then distributed these questionnaires among their employees and IT specialists working under contract and asked them to respond in a written form. In total, written responses from 11 respondents were returned to us.

Overall, including the pilot study, we conducted 38 semi-structured interviews (one interview with 2 interviewees) in five City Halls, and we received 11 written responses from respondents who preferred to be not recorded. Thus, altogether we received input from 50 employees

working in various positions at six City Halls and representing various levels of authority, such as vice-presidents of the cities, mayor's proxies, various directors, deputy directors, head of departments, IT managers, IT staff, and general ES users.

In the fourth phase, the interviews were transcribed and systematically analyzed to identify major emerging concepts. Details of the interviewed persons, including the City Hall at which they were employed (City Hall A, B, C, D, E, F), type of position held, form of obtained information, and the duration of the interviews can be found in Appendix 2.

The transcribed material was further analyzed with the use MAXQDA¹, a software program designed for qualitative and mixed methods data analysis. Conducting open coding, a process of identifying and labeling concepts that emerge from in-depth analysis of data (Strauss & Corbin, 1990), we arrived at an initial list of conceptual labels representing influential factors in ES implementation.

In the fifth phase we grouped conceptual labels into key concepts, representing driving forces in ES implementation. Thus, in essence, we transformed the initial list of conceptual labels into larger categories that are the building blocks of our conceptual framework.

In the actual process of constructing our conceptual framework we roughly followed the methodology proposed by Jabareen (2009). However, we had to modify Jabareen's approach, as we constructed our conceptual framework not only based on the literature, but primarily based on our interviews.

The sixth phase was focused on identifying relationships between the driving forces (key concepts) and their effects on ES implementation. The results of the sixth phase represent the connections between building blocks of our conceptual framework that will serve as guidance for future ES implementation projects in the public sector as well as provide a foundation for future research

The objective of the seventh phase, not conducted yet and not covered in the current paper, is validating and refining the preliminary conceptual framework.

¹ <https://www.maxqda.com/>

RESULTS

Using the methodology described in the previous section, using open coding and grouping the identified labels into broader themes, we arrived at six distinct concepts (or six major driving forces) affecting the phenomenon ES implementation. We labeled these six concepts, which came up in many of the interviews and appeared to be especially important to our interviewees, as political leadership, employee motivation, commercial base, financial resources, government regulations, and vendor quality. These concepts are further explained in the following subsections.

Political Leadership

This includes both extent and sway of political leadership. The high impact of current political leadership on ES implementation arose in many of the interviews. Often, high-ranking city officials were pushing for adoption of new ES, and often, appointed representatives were directly overseeing the ES implementations. Examples of an interviewee responses are:

When the idea to implement the system arose, there was a presidential agreement to do so (...) [the president] appointed people responsible for this implementation. The director of the organization's department and the City Secretary were strongly involved. A meeting with all governors, directors, and heads of departments or divisions was organized in each district, during which the project (...), its assumptions, and the schedule were presented. (Interviewee P1)

Support and commitment from the top were always, yes. Well, we cannot imagine the implementation of the system that people will want to use if they do not see any sense in it. (Interviewee P6)

... the team consisted of the employees of the department here, headed by the President's proxy. (Interviewee P9)

However only in two out of six City Halls (A and C) some interviewees stated that when the president considered to implement the key ES system or additional significant applications for residents, decisions to implement was undertaken collegially by a special commission consisting of the highest-ranking City Hall officers, including among others, politically involved president's advisers, the directors of IT service department, and possible external experts.

So, on the one hand, we have such a structure at the management, strategic, strictly principal level, i.e., we have a steering committee. (Interviewee P2)

When it comes to the Integrated Education Management System, there was a team that emerged from the public tender procedure team. (...) we had an external company, an external Project Manager. They certainly made a huge and substantive contribution [in managing the ES implementation] (Interviewee P28)

The deputies to city presidents often wielded immense influence. City presidents viewed ES implementation as part of their political agenda. It is quite possible that the local political leadership itself is influenced in their decisions by political party executives, national governmental bodies, international organizations and/or multinational corporations.

Employee Motivation

Many interviewees expressed the conviction that motivation is crucial in ES implementation. On one hand, self-motivation and faith in the mission of their work (serving the community) were raised as important issues related to work in the public sector in general. On the other hand, incentives, including financial ones, were mentioned as being important. Few of the interviewees stated:

For me, the biggest factor for success was the people. (...) I think that if it weren't for those people who were in the team, I don't know if we would have succeeded. How were we motivated? Probably some of the people who were in this working team positively influenced others. We also provided some financial motivations and some kind of distinctions. (Interviewee P3)

... we were motivated by the fact that we are doing something new. (...) we felt internally in the project team that it would simply lead to good changes inside the organization ... (Interviewee P10)

Being introduced to new technology and being able to train other employees on the new system seemed to be a strong motivator for many employees. Frequently, the advantages of the new system and the reasons for implementing it were presented at numerous meetings before and during the actual implementations. This was perceived as a way to convince the employees most resistant to change of the opportunities offered by the ES. This issue was very clearly expressed in many responses of interviewees from the City Hall A as provided below:

The meetings organized by the director of the Organization Department were aimed at familiarizing us with this project (...), informing about benefits for us and also about value added of it (...) It was also presented in a very positive light, in the context of ... [the success of other City Halls ES implementation]. (Interviewee P1)

Commercial Base

In this context, the commercial base represents the collection of business activities in a particular geographic area (Roztocki & Weistroffer, 2016). Several interviewees stated that the size of the city linked with the opportunities given by the commercial base, equated with registered enterprises and their internationalization, brings higher inflows for the city's budget, both from the companies directly as well as from people employed in these entities and living within the city boundaries. The interviewees perceived this issue as follows:

... if any functionalities were introduced, so that the City Hall is to operate uniformly, (...) the departments had to adapt to the operation of the system. Often, we said that we acted like this, and we need it like this. But that had to be a voice of all of City Hall. (...) On the other hand, if the finance department said that there should be something (...) in the contracts, it was imposed on all departments. It does not change the fact that (...) [the vendor] did not always want to do what we wanted, because other cities wanted differently. (...) often because (...) [city C] is big, they [vendor] did what we asked them to do. Because we always have specific issues. You can find everything here. (Interviewee P31)

I think that now there are also greater demands from our "clients". And that is why there is an attempt to meet these requirements somewhere, and here is probably the role of our President's proxy, who will want to somehow make the City Hall respond to the needs of "clients" [for all businesses and residents]. (Interviewee P31)

To conclude a stronger commercial base provides opportunity to collect more taxes and thus may result in higher levels of financial resources.

Financial Resources

In many interviews it became very apparent that City Halls with a higher level of financial resources were in a much better position to pursue ambitious projects. In public tenders, cities with better financial resources were able to attract more vendors to participate in the public tender and thus had more choices, allowing them to be more selective.

... the possibilities of the project budget are not that flexible, after all it results from the city budget. A certain amount is allocated for this, and in this amount, we must complete this task with a cheaper or more expensive system. And often the type of system you get depends on how much money you have. It's not like we want the best system because we have unlimited budget options. I am afraid there is no such city in Poland (...) (Interviewee P5)

Funds, if available in the budget. I think that with their proper commitment, creating and implementation of any system will bring the effects felt by everyone. (Interviewee P8)

In many cases, the magnitude of financial resources is related to the commercial base, but additional funds from central government or international organizations may supplement the available financial resources.

Government Regulations

This concept describes initiatives and regulations that impact information systems in the public sector. New regulations or initiatives may force implementations of new information systems. For example, during the time of our interviews, the Polish government was in the process of implementing a program called “Rodzina 500+” (In English “Family 500+). This program went into effect on July 1, 2019 and provides child support in the amount of 500 Polish zloty per child. There are no income criteria and children up to the age of 18 are eligible. Since a large number of applications was expected, a portal was created to make sure that the applications were handled in an efficient manner. Thus, the interviewed City Halls had little choice but to comply with this new government regulation and to find the most effective and efficient way to implement a new system.

Moderator: What was the reason for implementing the system?

Interviewee: ... those were requirements from acts of law. It is a bit of a trauma imposed on local governments in Poland that this management control was introduced here. (Interviewee P7)

The first thing is they [implementations of ES] were also imposed by an act of law. (Interviewee P11)

Vendor Quality

Some vendors seem to be more supportive than others. In many interviews it became very apparent that vendor quality is a central concern. A dedicated vendor who understands the limitations and needs of the public sector is helpful for the project. High vendor quality results from experience in delivery of ES in the public sector, experience in updating software because of changes in the regulations, being familiar with administrative procedures and functioning of the public organizations, recommendations prepared by previous public sector clients, and especially their opinion in terms of further post-implementation support. It was highlighted that

vendors experience in delivery of ES to a public organization was required in the specification of the public tender.

Additionally, interviewees from all City Halls agreed that vendors should be not only involved just in delivery of the ES, but also in providing additional services before, during and after ES implementation, such as trainings for staff and ongoing support. If these services are not provided by a vendor, the vendor's quality should be assessed as poor. Some of our interviewees stated:

... if we create something new, and we do not buy an already complete product [ES] (...) there is always a risk of integrity, performance, contractual flexibility [by vendor] ... (Interviewee P6)

These are definitely two lines [in supporting staff after ES implementation], the first, the technical line, is the company which signed a contract for the maintenance of this application with us. If the errors are really technical, that something does not work, the person can report directly to the company via the website. In some case [second line], we as a department are involved in solving the problems and I think that we can help technically and substantively as the top administrators. (Interviewee P9)

Preliminary Conceptual Framework

The preliminary conceptual framework is presented in Figure 2.

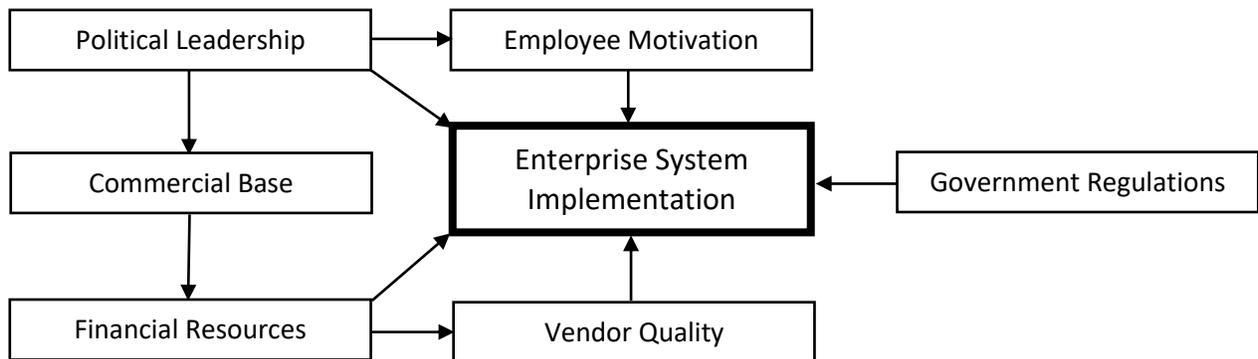


Figure 2. Conceptual Framework

As depicted in Figure 2, our conceptual framework identifies six major driving forces in ES implementation in the public sector, addressing the first part of our research question. To deal with the second part of our research question, in coding of our interview transcripts, we searched for possible relations between these six concepts.

In this framework, five key concepts that substantially and directly influence the process of ES implementation are: Political Leadership, Employee Motivation, Government Regulations, Financial Resources, and Vendor Quality. The Commercial Base only indirectly influences the process of ES implementation. The relationships between the driving forces are summarized in Table 1.

Table 1. Relationships between Driving Forces

Relationship	Description
Political Leadership → ES Implementation	Political Leadership has vast decisive power: it may bring about or simply terminate an ES implementation
Employee Motivation → ES Implementation	Employee Motivation has a huge effect on ES implementation as employees that are not motivated may wreck any large project
Governmental Regulations → ES Implementation	Governmental Regulations have an enormous effect as changes in regulations may require new systems while making old systems obsolete
Vendor Quality → ES Implementation	A dedicated vendor may be very helpful by dedicating resources and efforts
Financial Resources → ES Implementation	The magnitude of financial resources determines the range of options
Political Leadership → Employee Motivation	Political Leadership is in the position of providing motivations for employees by various means
Political Leadership → Commercial Base	Political Leadership has the authority to support or to hinder local businesses thru local regulation and other means
Commercial Base → Financial Resources	The economic power of local commercial bases determines the level of tax revenues
Financial Resources → Vendor Quality	A stronger financial position allows for a higher limit on a tender, a larger number of offers, and more selectivity

KEY FINDINGS, CONTRIBUTION, LIMITATIONS, FUTURE PLANS, AND CONCLUSIONS

We constructed a conceptual framework showing six driving forces in ES implementation in the public sector, viz. political leadership, employee motivation, government regulations, vendor quality, financial resources, and commercial base. Among these, political leadership stood out as

being by far the most important. Our framework also shows the interrelationships of these driving forces and their impact on ES implementation. Accordingly, political leadership directly impacts ES implementation, as it has vast decisive power. Moreover, political leadership may further influence ES implementation indirectly, as its actions have a direct impact on employee motivation and the commercial base. Commercial base is indirectly related to ES implementation. When the local commercial base is highly developed, it is more likely to generate large inflows to the local budget, which ultimately increases the options for choosing reliable vendors (vendor quality in the framework) that are able to deliver the expensive ES, and provides the financial resources for the ES implementation. The local commercial base can be expanded by competent political leadership by surmounting existing economic, social and environmental limitations. Political leadership is responsible for creating the appropriate conditions that attract businesses to locate in a given region. Furthermore, political leadership is instrumental in enabling appropriate employee motivation by sustaining effective performance management practices.

Our research described in this paper was conducted in the public sector in Poland, a transition economy, that is, an economy that has recently transitioned from a centrally planned system and one-party rule to a more open society with a market driven economy. Transition economies differ from established market economies like the USA or Germany in organizational and management culture (Roztocki & Weistroffer, 2015), thus our findings may not be transferable to more mature societies with a longer tradition of democracy. As indicated in our methodology section, we did not complete the final phase of our proposed research, that is, the validation and refining of the preliminary conceptual framework proposed in this paper. A possible approach, and thus a future research opportunity, is to validate our framework by other methods besides interviews, such as surveys or observations. A different research opportunity may be to replicate our case study in a different country, perhaps in a country with a mature market economy and long tradition of democracy.

Also conducting research more at an individual level may be very interesting. In particular, it would be very interesting to investigate how individual employees view the driving force of employee motivation. A different research opportunity is to explore how various stakeholders perceive success of an ES implementation in the public sector, as there seems to be no universal definition of what makes any information system successful.

The current study and our framework contribute to practice in that they offer managers and other decision-makers involved with public sector ES implementations a better understanding of the driving forces to be monitored in these types of projects. Overall, our work also contributes to the academic body of knowledge by providing a sound foundation for further research on the topic of ES implementation in the public sector. To conclude, we are positive that our research and our ideas will inspire other scholars and our conceptual framework will be a driver for future research.

Acknowledgement

We would like to thank all the employees at the City Halls who dedicated their time and shared their experiences for this study. This work was supported by the Polish National Science Centre, Poland, Grant No. 2018/29/B/HS4/02578.

REFERENCES

- Al-Harathi, N. J., & Saudagar, A. K. J. (2020). Drivers for successful implementation of ERP in Saudi Arabia public sector: A case study. *Journal of Information and Optimization Sciences*, 41(3), 779-798. <https://doi.org/10.1080/02522667.2019.1616909>
- Allen, D., Kern, T., & Havenhand, M. (2002). *ERP critical success factors: an exploration of the contextual factors in public sector institutions* Proceedings of the 35th Annual Hawaii International Conference on System Sciences (HICSS), Maui, Hawaii.
- Alves, M. d. C. G., & Matos, S. I. A. (2013). ERP adoption by public and private organizations – a comparative analysis of successful implementations. *Journal of Business Economics and Management*, 14(3), 500-519. <https://doi.org/10.3846/16111699.2011.652979>
- Beheshti, H. M., & Beheshti, C. M. (2010). Improving productivity and firm performance with enterprise resource planning. *Enterprise Information Systems*, 4(4), 445-472. <https://doi.org/10.1080/17517575.2010.511276>
- Bingi, P., Sharma, M. K., & Godla, J. K. (1999). Critical Issues Affecting an ERP Implementation. *Information Systems Management*, 16(3), 7-14. <https://doi.org/10.1201/1078/43197.16.3.19990601/31310.2>
- Blick, G., Gulledge, T., & Sommer, R. (2000). *Defining business process requirements for large scale public sector ERP implementations: A case study* Proceedings of the European Conference on Information Systems (ECIS), Vienna, Austria.
- Bukamal, O. M., & Abu Wadi, R. M. (2016). Factors influencing the success of ERP system implementation in the public sector in the Kingdom of Bahrain. *International Journal of Economics and Finance*, 8(12), 21-36. <https://doi.org/10.5539/ijef.v8n12p21>
- Carter, L., & Belanger, F. (2005). The Utilization of e-Government Services: Citizen Trust, Innovation and Acceptance Factors. *Information Systems Journal*, 15(1), 5-25.
- Chou, S.-W., & Chang, Y.-C. (2008). The implementation factors that influence the ERP (enterprise resource planning) benefits. *Decision Support Systems*, 46(1), 149-157. <https://doi.org/https://doi.org/10.1016/j.dss.2008.06.003>

- Crisostomo, D. T. (2008). Characteristics and skills of implementing an ERP system in the Guam Public Sector. *Journal of International Business Research*, 7(1), 31-52.
- Davenport, T. H. (1998). Putting the Enterprise into the Enterprise System. *Harvard Business Review*, 76(4), 121-131.
- Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *The Academy of Management Review*, 14(4), 532-550. <https://doi.org/10.2307/258557>
- Esteves, J., & Pastor, J. (2001). Enterprise resource planning systems research: An annotated bibliography. *Communications of the Association for Information Systems*, 7, 1-52. <https://doi.org/10.17705/1CAIS.00708>
- Fernandez, D., Zainol, Z., & Ahmad, H. (2017). The impacts of ERP systems on public sector organizations. *Procedia Computer Science*, 111, 31-36. <https://doi.org/https://doi.org/10.1016/j.procs.2017.06.006>
- Gronlund, A., & Horan, T. A. (2005). Introducing e-Gov: History, Definitions, and Issues. *Communications of the Association for Information Systems*, 15, Article 39.
- Holland, C. P., & Light, B. (1999). A Critical Success Factors Model for ERP Implementation. *IEEE Software*, 16(3), 30-36. <https://doi.org/10.1109/52.765784>
- Jabareen, Y. (2009). Building a Conceptual Framework: Philosophy, Definitions, and Procedure. *International Journal of Qualitative Methods*, 8(4), 49-62. <https://doi.org/10.1177/160940690900800406>
- Koch, S., & Mitlöhner, J. (2010). Effort estimation for enterprise resource planning implementation projects using social choice – a comparative study. *Enterprise Information Systems*, 4(3), 265-281. <https://doi.org/10.1080/17517575.2010.496494>
- Kumar, V., Maheshwari, B., & Kumar, U. (2002). ERP systems implementation: best practices in Canadian government organizations. *Government Information Quarterly*, 19(2), 147-172. [https://doi.org/https://doi.org/10.1016/S0740-624X\(02\)00092-8](https://doi.org/https://doi.org/10.1016/S0740-624X(02)00092-8)
- Liang, H., Saraf, N., Hu, Q., & Xue, Y. (2007). Assimilation of enterprise systems: The effect of institutional pressures and the mediating role of top management. *MIS Quarterly*, 31(1), 59-87.
- McNurlin, B. C., & Sprague, R. H. (2002). *Information Systems Management in Practice*. Prentice Hall.
- Parr, A., & Shanks, G. (2000). A model of ERP project implementation. *Journal of Information Technology*, 15(4), 289-303. <https://doi.org/10.1080/02683960010009051>
- Qu, W. G., Ding, Y., Shou, Y., Zhou, H., & Du, H. (2014). The impact of enterprise systems on process flexibility and organisational flexibility. *Enterprise Information Systems*, 8(5), 563-581. <https://doi.org/10.1080/17517575.2014.925586>
- Rainey, H. G., Backoff, R. W., & Levine, C. H. (1976). Comparing Public and Private Organizations. *Public Administration Review*, 36(2), 233-244.
- Raymond, L., Uwizeyemungu, S., & Bergeron, F. (2006). Motivation to implement ERP in e-government: An analysis from success stories. *Electronic Government*, 3(3), 225-240. <https://doi.org/10.1504/EG.2006.009597>
- Roztocki, N., & Weistroffer, H. R. (2015). Information and communication technology in transition economies: An assessment of research trends. *Information Technology for Development*, 21(3), 330-364. <https://doi.org/10.1080/02681102.2014.891498>
- Roztocki, N., & Weistroffer, H. R. (2016). Conceptualizing and Researching the Adoption of ICT and the Impact on Socioeconomic Development. *Information Technology for Development*, 22(4), 541-549. <https://doi.org/10.1080/02681102.2016.1196097>

- Seres, L., Tumbas, P., Matkovic, P., & Sakal, M. (2019). Critical Success Factors in ERP System Adoption: Comparative Analysis of the Private and the Public Sector. *E+M Ekonomie a Management*, 22(2), 203-221. <https://doi.org/10.15240/tul/001/2019-2-014>
- Sommer, R. (2011). Public sector ERP implementation: Successfully engaging middle-management. *Communications of the IBIMA*, 2011, 1-11. <https://doi.org/10.5171/2011.162439>
- Strauss, A. L., & Corbin, J. M. (1990). *Basics of Qualitative Research: Grounded theory Procedures and Techniques*. Sage Publications, Inc.
- Thomas, G. A., & Jajodia, S. (2004). Commercial- Off-The- Shelf Enterprise Resource Planning Software Implementations in the Public Sector: Practical Approaches for Improving Project Success. *The Journal of Government Financial Management*, 53(2), 12-19.
- Tsai, W.-H., Chen, S.-P., Hwang, E. T. Y., & Hsu, J.-L. (2010). A Study of the Impact of Business Process on the ERP System Effectiveness. *International Journal of Business and Management*, 5(9). <https://doi.org/10.5539/ijbm.v5n9p26>
- Wagner, W., & Antonucci, Y. L. (2009). The ImaginePA Project: The first large-scale, public sector ERP implementation. *Information Systems Management*, 26(3), 275-284. <https://doi.org/10.1080/10580530903017401>
- Yin, R. K. (2014). *Case Study Research: Design and Methods*. Sage Publications.
- Zeng, Y., & Skibniewski, M. J. (2013). Risk assessment for enterprise resource planning (ERP) system implementations: a fault tree analysis approach. *Enterprise Information Systems*, 7(3), 332-353. <https://doi.org/10.1080/17517575.2012.690049>
- Ziemba, E., & Oblak, I. (2013). Critical success factors for ERP systems implementation in public administration. *Interdisciplinary Journal of Information, Knowledge, and Management*, 8, 1-019. <https://doi.org/10.28945/1785>
- Zmud, R., Carte, T., & Te'eni, D. (2004). *Information Systems in Nonprofits and Governments: Do We Need Different Theories?* Proceedings of the International Conference on Information Systems (ICIS), Washington, DC.

APPENDIX 1. INTERVIEW SCENARIO

The estimated time of interview is 45 minutes. The interview will be recorded.

Imprint:

Position

Function/role in the implementation of ES

Female/Male

Name of department/office. Division

Initial questions:

1. What kind of ES does the City Hall operate and what is the scope of their operations?
2. What was the reason for the implementation of the integrated system?
3. How was the system selected?
4. How was the final decision about the choice of the system and the procedure for its implementation made?
5. How was the purchase and implementation of the system financed? How flexible was the budget in this regard?

Implementation of the ES

6. What was the system implementation process like?
 - a. Was a project team formed and what was its composition?
 - b. Were team meetings organized? If any, how often?
 - c. Did the project team set deadlines for implementing the system?
 - d. Did you have a formalized action plan?
 - e. Were the system implementation schedule and costs monitored?
 - f. Was the scope of the project defined in detail?
 - g. Where and how did you get motivated by decision makers?
7. Could you indicate the factors that determine the effectiveness of the system implementation?
8. Were the employees trained before implementing the system?
 - a. What was the way of training and knowledge exchange like?
 - b. Do you propose any changes to the training method?
9. Did the implementation of the system require any changes (redesign) of procedures in City Hall? What were these changes?
10. Was it necessary to standardize the processes inside City Hall in order to implement the system? What was the standardization process?
11. Has the system been integrated with the existing internal and / or external systems? Please describe what this integration was about?
12. Was the system implemented on time, in line with the budget and the expectations of the awarding entities?
13. Are the users satisfied with the system?

Implementation effects

14. Please describe what, in your opinion, the implementation of the system in City Hall contributed? (To what extent has the system improved the City Hall operations?)
15. Did the implementation of the ES have an impact on the residents' satisfaction with the services provided? What is your opinion?
16. Do you have any advice for other City Halls regarding the implementation of the ES?

Use of information and system capabilities

17. How is the information provided by the ES used on following levels?
 - a) Managing staff (e.g., president, vice-presidents, directors, managers, chiefs)
 - b) System users
18. Could you indicate the factors that determine the use of information from the system?
19. Do you think that the current system is adequate?
20. Do you have anything to add?

APPENDIX 2. DATA COLLECTION DETAILS

Data Sources			
• Total Interviews, N = 39			
<i>Profiles of employees interviewed</i>	<i>Interviewee Codes</i>	<i>City Hall Codes (Date)</i>	<i>Duration</i>
Head of the Delegation of the Administration and Civic Affairs Office (City District A)	P1	A (May 2019)	55 min
Deputy Director of the IT and Information Processing Office	P2	A (May 2019)	63 min
Deputy Director in the Accounting and Countersignature Office	P3	A (May 2019)	45 min
Senior Specialist in the Exploitation Department in the Debt and Debt Restructuring Office	P4	A (May 2019)	32 min
Director of the IT and Information Processing Office	P5	A (May 2019)	42 min
Senior Specialist in the Risk Department in City President Office	P6	A (May 2019)	62 min
President's proxy for Risk Management, Deputy Head of the Risk Department in City President Office	P7	A (May 2019)	68 min
Senior Specialist in the Exploitation Department in the Debt and Debt Restructuring Office	P8	A (May 2019)	16 min
Senior Specialist in the Risk Department in City President Office	P9	A (May 2019)	53 min
Secretary of the City Hall in City President Office	P10	A (May 2019)	29 min
Head of the Delegation of the Administration and Civic Affairs Office (City District B)	P11	A (May 2019)	16 min
Deputy President of the City	P12	B (June 2019)	33 min
Director of the IT and Telecommunications Service Office	P13	B (June 2019)	66 min
Deputy Director of the IT and Telecommunications Service Office	P14	B (June 2019)	41 min
Senior Specialist in the and Telecommunications Service Office	P15	B (June 2019)	38 min
IT Specialist in the and Telecommunications Service Office	P16	B (June 2019)	23 min
Inspector in the and Telecommunications Service Office	P17	B (June 2019)	15 min
Director of the Organizational and Administrative Department	P18	B (June 2019)	20 min
Head of the City Road Administration/Traffic Control Department	P19	B (June 2019)	43 min
Head of the Finance Department	P20	B (June 2019)	20 min
Head of the Intelligent Transport Systems Department	P21	B (June 2019)	20 min

Director of Internal Audit Team	P22	C (June 2019)	53 min
Senior Inspector in the Department of Strategy, Planning and Monitoring of Investment	P23	C (June 2019)	27 min
Inspector in the Department of Strategy, Planning and Monitoring of Investment	P24		
Deputy Director of the Department of Strategy, Planning and Monitoring of Investment	P25	C (June 2019)	81 min
Senior Specialist in the Department of Organization and Supervision	P26	C (June 2019)	32 min
President's proxy for the Development of the IT System, Department for Development of the GMK IT System	P27	C (June 2019)	51 min
Director of the IT Department	P28	C (June 2019)	57 min
Head of the Information Society Division in the Department of Organization and Supervision	P29	C (June 2019)	61 min
Senior Specialist in the Department of Organization and Supervision	P30	C (June 2019)	55 min
Head of the Application Management Division in the IT Department	P31	C (June 2019)	39 min
Director of IT Department	P32	D (July 2019)	70 min
President's proxy for Smart City, Head of Digitalization and Cybersecurity Office	P33	D (July 2019)	17 min
Head of the Financial Department	P34	D (July 2019)	26 min
Director of the Budget and Controlling Department, Deputy City Treasurer	P35	D (July 2019)	59 min
Head of the Procurement Division of the City Hall Service Department	P36	D (July 2019)	48 min
Senior Inspector in the City Hall Service Department	P37	D (July 2019)	38 min
The Acting Director of IT Department	P38	E (August 2019)	90 min
Senior Specialist in the IT Department	P39	E (August 2019)	36 min
• Total written responses, N = 11			
Deputy Director of KSAT Department, Service and Administration Department	P40	F (August 2019)	NA
Director of SAP Department, Service and Administration Department	P41	F (August 2019)	NA
Senior Specialist in Public Finance Division in Accounting Department	P42	F (August 2019)	NA
Senior Specialist in Public Finance Division in Accounting Department	P43	F (August 2019)	NA
Head of Public Finance Division in Accounting Department	P44	F (August 2019)	NA
Head of IT Department at the IT Services Center*	P45	F (August 2019)	NA

IT Administrator at the IT Services Center	P46	F (August 2019)	NA
Senior IT Administrator at the IT Services Center	P47	F (August 2019)	NA
Senior IT Administrator at the IT Services Center	P48	F (August 2019)	NA
Senior IT Administrator at the IT Services Center	P49	F (August 2019)	NA
Deputy Head of IT Department at the IT Services Center	P50	F (August 2019)	NA

* IT Services Center is a publicly owned organization established by City F to outsource the IT services for the City Hall and other communal units. IT Services Center was created to build a highly professional IT organization, bringing together high-class specialists to support City Hall and all linked public units, which was difficult to implement in the City Hall with limited budget for staff salaries.