

Problems in Enterprise System Implementation Across the System Lifecycle: Transition versus Developed Economies

by

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ABSTRACT

The results of investigation into similarities and differences between problems of enterprise system (ES) implementation in transition and developed economies are presented. In doing so, the research builds on the opinions of ES practitioners from Poland, a transition economy from Central and Eastern Europe. The main findings suggest that problems in developed economies seemed to be clearly assigned to a specific ES implementation phase whereas in Polish companies difficulties seem to span through all the lifecycle phases. In addition, it is noticeable that in transition economies practitioners have to deal mostly with system-related issues, while in developed economies the shift from system-related to business-related problems throughout the system lifecycle is clearly visible.

Keywords:

Enterprise system, ERP, implementation, adoption, lifecycle, problem, transition economy, Poland.

Article Type: Research paper

INTRODUCTION

Transition economies are defined as countries that are in transition from a communist style central planning system to a free market system (Roztock and Weistroffer, 2008b). Most transition economies can be recognized as emerging economies that are a subgroup of developing economies and include countries having low absolute, but fast growing, per capita income. Also, emerging economies usually have governments that are dedicated to economic liberalization (Roztock and Weistroffer, 2008a).

The process of information technology (IT) adoption in developing countries is connected with different considerations as compared to practice observed in developed economies

(Bingi, Leff, Shipchandler and Rao, 2000; Roztocki and Weistroffer, 2008a). In particular, IT adoption projects conducted in developing and transition economies struggle with lack of IT experience, inadequate IT infrastructure and maturity, and lack of long term strategic thinking (Huang and Palvia, 2001; Roztocki and Weistroffer, 2008b).

Different considerations experienced by transition and developed economies also apply to enterprise system (ES) adoptions projects, which are one of the most advanced IT-related large-scale investments. ES, having their roots in MRP, MRP II, and ERP systems, are now very complex systems that support the management and integration of the whole company and offer inter-organizational integration with company's clients and suppliers (Volkoff, Strong and Elmes, 2005). ES adoptions span the whole organization, involve multiple stakeholders both from within the company and external organizations, extend over time, and, in consequence, are very costly (Brown and Vessey, 2003; Jones, 2008).

During the usually long process of ES adoption the company may experience many problems and impediments to project success (e.g. Kim, Lee and Gosain, 2005). The multi-staged character of ES adoption calls for the incorporation of the system lifecycle into the investigation of ES adoption issues (Themistocleous, Soja and Cunha, 2011). This observation and different ES considerations experienced by projects conducted in transition and developed economies were the main drivers for this research.

The goal of this paper is to investigate differences in impediments to ES adoption success between transition and developed economies. In doing so, the current research incorporates the multi-staged nature of ES adoptions and seeks to explore how the problems change across the system lifecycle. The particular research question involved can be formulated as follows:

- How do the difficulties experienced by ES adoptions change across the system lifecycle and how do they differ between transition and developed economies?

In order to compare the problems experienced by ES adoptions between transition and developed economies, the authors drew from the opinions of practitioners from Poland, a transition economy from Central and Eastern Europe. The discovered issues were then compared with the findings of Markus, Axline, Petrie, and Tanis (2000), who built on the experience of developed economies. Their research is shortly described in the research background section, which follows the introduction. Next, the research methodology is depicted which is followed by the presentation of results. Then, the paper discusses the main findings and closes with concluding remarks.

RESEARCH BACKGROUND

Prior literature dealing with ES adoptions mostly builds on the experience of developed countries from Western Europe and North America, where most ES developers are located and implementations have occurred (Davison, 2002). This rule also applies to studies dealing with difficulties experienced by ES adoption projects. In particular, Markus et al. (2000) conducted research among a few dozen respondents from North America and Europe, both adopters and experts representing system suppliers. Another study, conducted by Kim et al. (2005), is based on a survey of the largest American organizations listed in Fortune 500. Kremers and van Dissel (2000), in turn, focused on the issues connected with migrations of ERP systems and conducted research among Baan customers mainly from highly developed countries from Europe and from the USA and Australia. Next, Wright and Wright (2002) conducted interviews with experts from the largest American consultancy firms. Finally, Themistocleous, Irani, O'Keefe and Paul (2001) performed an Internet survey and gathered responses from ES adopters mainly from Europe, North America, and Australia.

The prior studies conducted in developed countries recognized mainly organizational problems connected with time over-runs and lack of alignment of organizational structure with the adopted ES. The practitioners from industrialized countries also acknowledged difficulties connected with the enterprise system deficiencies. The group of the most important impediments to ES adoption success is complemented by difficulties connected with lack of user involvement. ES projects in developed economies also suffered from inter-departmental conflicts, inadequate training, and problems with system customization. However, these problems affected ES adoption to a lesser extent.

Prior research suggests that ES adoptions in transition economies differ from ES projects conducted in developed countries. This might be connected with various factors such as fast changing laws and regulations, strong governmental control, low and rising salaries, high demand for highly qualified workers, and continuous and fast economic growth (Roztocki and Weistroffer, 2011b). ES adoptions in transition economies, as compared to developed countries, seem to be affected to a greater extent by financial and people-related problems (Soja, 2008; 2011). Also, ES adopters in transition economies appeared to place greater emphasis on phased ES deployments and expected higher levels of external support (Bernroider, Sudzina and Pucihar, 2011). In addition, ES adoption projects may go through a different system lifecycle and might require different roles of the project participants, as compared to developed countries (Themistocleous, Soja and Cunha, 2011).

The main shortcoming of prior research is connected with the fact that, in transition economies, research works on IT investments in general and ES adoption in particular are scarce (Roztocki and Weistroffer, 2011a). In particular, they include two studies conducted in Poland, a European transition economy. The first study was based on the opinions of experts representing ES suppliers (Soja, 2008). The second research paper analyzed source problems in ES adoptions and drew from the experience of various practitioners representing ES adopters (Soja and Paliwoda-Pękosz, 2009). The results of prior studies suggest that the most significant difficulties experienced by the organizations in transition economies include:

- problems connected with the knowledge, education, and attitudes of various stakeholders,
- high costs of ES implementation,
- organizational problems connected with ES adoption planning, such as goal setting and the assessment of a company's condition.

Another shortcoming of prior research is connected with the multi-staged character of ES adoptions and resulting changing considerations across phases of the project. In particular, among the abovementioned prior research works dealing with difficulties in ES adoption, only the study by Markus et al. (2000) incorporated the system lifecycle into the research approach. Their categorization includes the following four ES implementation stages (Markus and Tanis, 2000):

- Project chartering – making a key business decisions concerning the scope of the project, budgeting, choosing system vendor, etc.
- The project – the main implementation phase with the purpose of getting system and users “up and running”,
- Shakedown – stabilizing and incorporating ES in everyday operations,
- Onward and upward – deriving benefits from ES implementation.

Prior literature includes various definitions of the ES lifecycle. The most interesting examples include the proposition of Parr and Shanks (2000) who divided the whole ES adoption process into three general phases: Planning, Project, and Enhancement. Within the Project phase, they defined five sub-phases: Set up, Reengineering, Design, Configuration and testing, and Installation. Another example includes the definition of Ross and Vitale (2000) who proposed five ES adoption stages: design, implementation, stabilization, continuous

improvement, and transformation. Nonetheless, the most comprehensive definition of the ES lifecycle was proposed by Somers and Nelson (2004) who distinguished six implementation phases grounding their approach in the six-stage model of IT diffusion (Cooper and Zmud 1990). The suggested stages of ES implementation are as follows:

- Initiation – a company recognizes and justifies the need for ES implementation (which may have organizational or technological background), chooses the ES and its provider,
- Adoption – the final decision to invest resources is reached, the project is defined and participants of the project are selected,
- Adaptation – the enterprise system is installed, the needed organizational changes are made, users are trained in two directions: how to use the new ES application and how to operate in new business processes and procedures,
- Acceptance – organizational members are induced to commit to ES application usage and in consequence the ES is employed in organizational work,
- Routinization – the company uses the ES on a daily basis, the organizational procedures are appropriately adjusted,
- Infusion – increase in organizational effectiveness takes place, the company should experience the maximum benefits from ES implementation.

The purpose of this study is to address the abovementioned shortcomings of prior research connected with lack of research conducted in transition economies and lack of incorporation of the lifecycle in the ES adoption-related research. To this end, this study employs the lifecycle model defined by Somers and Nelson (2004), builds on the research conducted among Polish practitioners, and maps the achieved results onto the results of Markus et al. (2000) who uniquely incorporated the system lifecycle into their research approach dealing with ES adoption difficulties.

METHODOLOGY

The current research is an extension of the authors' previous work investigating the problems during enterprise system implementation (Authors, 2009 - blinded at this stage due to the double blind reviewing process). The authors, as the background method of research, applied qualitative approach based on the grounded theory developed by Glaser and Strauss (1967). The data-gathering process was conducted via interviews with practitioners, who were asked

to elicit problems that they encountered during ES implementation. The interviewees assigned these problems to a certain project phase according to the Cooper and Zmud (1990) classification of the project phases.

82 ES practitioners expressed their opinions and mentioned 433 problems in total. These problems were interpreted and classified by the authors using open and axial coding (Corbin and Strauss, 1990) and investigator triangulation (Myers, 2009, p.11) as the basic methods of data analysis. As a result, the problems were classified into a two level taxonomy and, in the next phase, the analysis of the problem occurrence across the system lifecycle was conducted. In order to compare the achieved findings with the results from developed economies, the study by Markus et al. (2000) was chosen.

This study was based on a different classification of ES lifecycle stages, therefore, the mapping of the two employed lifecycle models was needed. On the basis of descriptions of stages from these two models, the authors proposed the phase mapping presented in Table 1. In the next stage of the analysis, the difficulties declared by this study's respondents were mapped onto the problems listed by Markus et al. (2000). The results of the conducted analysis are presented in Table 2.

Lifecycle stages proposed by Cooper and Zmud (1990)	ES lifecycle stages proposed by Markus et al. (2000)
Initiation Adoption	Project chartering
Adaptation Acceptance	The project
Routinization	Shakedown
Infusion	Onward and upward

Table 1. Mapping of ES Lifecycle Phases

RESULTS

Table 2 presents the results of mapping of problems reported by this study's respondents onto the taxonomy of difficulties elaborated by Markus et al. (2000). The level of problem occurrence across different stages of the lifecycle was marked by appropriate bullets. The occurrences of problems among Polish respondents were indicated in columns named TE (transition economy), while the occurrences of difficulties on the basis of Markus et al.'s (2000) research were listed in columns DE (developed economies).

Phase	Chartering		Project		Shakedown		Onward	
	TE	DE	TE	DE	TE	DE	TE	DE
lack of results orientation in the business	●	●						
culture resistant to change	●	●	●		●		●	
lack of top management support	○	●						
system integration	●		●	●	○		○	
implementation consultants	○		○	●	○		○	
cutting end-user training	●		●	●	○		○	
inadequate testing				●				
BPR (not first improving business processes where this needs doing)	○		○	●	○			
data quality	●		●	●	○			
reports			○	●			○	
software modification				●				
personnel turnover				●				
emphasis on functional perspective				●				
inappropriately project scope cutting				●				
system performance	○		●		○	●	●	
decreased performance of business processes						●		
disappointing business results								●
fragile human capital	●		●	○	●		●	●
migration problems				○				●
unknown business results								●
IT infrastructure	●		●		○		○	
system-misfit	●		●		●		●	
enterprise financial and organizational condition	○		●		○		○	
legacy systems replacement	○		●					
problems with implementation process (duration time, participants, project definition)	●		●		○			
trainings scope and schedule	○		○		○		○	
legal regulation and situation in industry	○		○					

Note: Bullets represent the level of problem occurrence reported by the respondents: ● – high, ● – medium ○ – low

Table 2. Mapping Problems Reported by Polish ES Practitioners onto Difficulties in Developed Economies

DISCUSSION

Similarities and Differences between Transition and Developed Economies

Companies from both types of economies perceived at the similar level difficulties connected with lack of results orientation in the business and lack of top management support. These impediments were encountered during the first organizational stage of the implementation project. Also, both groups of practitioners declared with the similar emphasis difficulties connected with reporting in the project phase, however, Polish respondents also pointed to this problem during the last phase of the project.

There were several difficulties that were not clearly perceived by the Polish respondents but proved significant for practitioners from industrialized countries. The majority of them occurred during the project phase and referred to difficulties connected with cutting scope of the project, lack of BPR, inadequate testing, and problems resulting from software modifications. These project phase-specific problems were complemented by difficulties visible during the last phase of the implementation, which were connected with decrease in company's processes performance and disappointing business results. The problems in developed economies tended to evolve from system-related to those connected with business as the implementation proceeded from the project phase to the onward and upward phase.

Practitioners from transition economies, on the other hand, tended to focus on the system-related issues. In doing so, they uniquely perceived problems connected with IT infrastructure and lack of fit between the company processes and the adopted enterprise system. In addition, instead of recognizing problems with business performance, Polish practitioners pointed to problems connected with an unsatisfactory enterprise system performance. They also perceived to a greater extent problems connected with system integration. It is interesting to note that, among Polish companies, the system-related problems occurred first and foremost during the project phase, which is similar to the situation in developed economies. However, among Polish practitioners these problems also appeared to some extent during the whole implementation project.

Practitioners from Polish companies seemed to suffer more from people-related problems which were captured by difficulties connected with a company culture resistant to change and related to fragile human capital. In both developed and transition economies practitioners experienced people's resistance mainly during the first phase of the implementation. However, among transition economies this problem was also significant in the remaining

phases. The similar rule applied to difficulties connected with human capital, which occurred over the whole implementation in transition economies, while their main occurrence among developed economies falls within the last phase and, to a lesser extent, the project phase.

Difficulties connected with implementation consultants occurred primarily during the project phase in the case of developed economies. Among transition economies, on the other hand, difficulties with the provider representatives occurred to a much lesser extent and seemed to span over the whole implementation.

Various impediments related to trainings seemed to affect ES implementations conducted among transition economies to a greater extent than projects taking place in developed countries. The latter suffered first and foremost from cutting end user training during the project phase, which was also true in the case of ES implementations in transition economies. However, practitioners from Polish companies were also affected by problems with quality and organization of trainings over the remaining phases of an implementation project.

Polish ES practitioners uniquely perceived problems connected with financial and organizational conditions of an ES adopting company. Problems of this kind occurred to some extent over the whole ES implementation process with the tendency to concentrate in the project phase. The similar rule applies to problems connected with the implementation project definition and organization, which were also uniquely reported by Polish practitioners. However, in this case, we may notice a greater emphasis on the first, chartering phase of the implementation project. The group of difficulties uniquely reported by the Polish respondents is complemented by problems having their roots in the company's environment and connected with changing legal regulations and situation in industry.

The group of problems that deserve our special attention is connected with system migration. Polish practitioners perceived difficulties of this kind with respect to migration from legacy systems to the new enterprise system. However, on the other hand, practitioners from developed economies report the migration from the previous version of an enterprise system to the newer version or to another brand of the system. In both cases, the project phase was the focal point of difficulties connected with system migration.

Upon comparing phases of the ES implementation, we may observe that ES implementations in both economies experienced the greatest difficulties during the project phase of an implementation. In addition, Polish practitioners seemed to experience significantly greater difficulties during the first phase of the implementation. The same, although to a lesser

extent, applies to the remaining phases, i.e. shakedown phase and onward and upward phase. It turns out that during these phases Polish practitioners experienced many different problems, however, their intensity was limited.

Summing up, companies from developed economies paid closer attention to business-related issues as opposed to companies from a transition economy that were distracted mostly by system-related problems. Problems in a transition economy tended to spread over time and affect companies to a greater extent than in developed economies. Specifically, constant care is required as regards cooperation with the system vendor, which confirms the findings of Themistocleous et al. (2011) suggesting that in transition economies different rules of collaboration between ES adopters and providers may exist.

Both studies reported problems with system migration mainly during the project phase, however, they were of different nature: Polish companies migrated from previous legacy systems whereas companies in developed economies upgraded their current ES systems to a newer version or changed the brand of ES system. This confirms the previous research findings suggesting that companies in transition economies were in the first wave of ES adoption (e.g. Lukman, Hackney, Popovic, Jaklic and Irani, 2011) whereas companies from developed economies experienced second or even third wave of ES adoption (Shanks, Seddon and Willcocks, 2003; Stein and Hawking, 2003).

Limitations and Future Research

The main limitation of this study's findings is connected with the scope of research results. This is due to the research respondents who represent ES practitioners from Poland. In consequence, we should generalize the results for other countries with caution. Supposedly, the scope of this study's findings should cover countries from Central and Eastern Europe which belonged to the Communist Bloc after the World War II but recently joined the European Union and are now undergoing economic transition. Also, other countries from the same geographical region may benefit from this study's result, however, to a smaller extent. This refers to two countries neighboring Poland: Ukraine and Belarus, which now reveal a lower level of development than Poland.

The findings suggest some avenues for further research which may focus on investigating the causal structure and mutual relationships among the discovered impediments. To this end, future studies may involve a multi-method research combining qualitative and quantitative approaches and should incorporate a substantial research sample. Another strand of future

research may be connected with an in-depth stakeholder analysis of the experienced difficulties with the purpose of discovering the mechanisms useful in better stakeholder management during the ES adoption projects. Finally, future studies may focus on examination of the influence of the experienced difficulties on ES adoption success.

CONCLUSION

This paper presents the results of comparing problems accruing during ES implementations across the system lifecycle in transition and developed economies. First, the problems reported by Polish practitioners, operating in a transition economy, were elicited and classified. Next, the results were compared with the results of research conducted by Markus, Axline, Petrie and Tanis (2000) concerning companies that operate in developed economies. In doing so, the authors proposed the mapping between different ES lifecycle stages that were adopted by both studies. The results reveal some similarities in problem perception between both studies, mainly during the first organizational stage of ES implementation, concerning lack of result orientation in the business and lack of top management support. Nonetheless, the achieved results suggest that differences are more significant. Firstly, in companies that operate in developed economies, a shift from system-related problems to business-related problems was noticeable over time, whereas companies in a transition economy tended to struggle mainly with system-related issues throughout the whole system lifecycle. Secondly, people-related problems were visible mostly during the chartering phase in both studies, however, they were also recognized during other phases of ES implementation by Polish practitioners. Similarly, training problems recognized mostly in the project phase were also noticeable in other phases in a transition economy. Finally, there appeared problems specific for Polish companies, e.g. difficulties connected with financial and organizational condition, mostly visible during the project phase, and problems with the implementation project management emphasized greatly in the chartering phase.

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