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# Rethinking Critical Success Factors for Enterprise System Adoption: The Case of a Transition Economy

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## ABSTRACT

This study's goal is to investigate and better understand critical success factors (CSFs) for enterprise system (ES) adoption. The research setting embraces ES adoptions conducted in Polish companies, therefore it focuses on a transition economy environment. On the basis of research conducted among more than a hundred Polish companies that had adopted ES, an analysis based on grounded theory revealed 20 CSFs grouped into 4 categories. Next, a stakeholder analysis of discovered CSFs allowed us to propose stakeholder groups, the evaluation of their importance and relationships. Achieved results were compared with the findings of prior research conducted in developed and developing economies. The main results suggest that CSFs for ES adoption in transition economies are first and foremost people-related. The article concludes with the discussion of further research.

## Keywords

Critical success factors, enterprise system adoption, emerging economy, transition economy.

## INTRODUCTION

Enterprise systems (ES) are application software packages that contain mechanisms supporting the management of the whole enterprise and integrate all areas of its functioning (Davenport, 1998). ES adoption is usually a lengthy process during which company's resources are massively overloaded. This refers not only to financial resources, which are burdened due to the high cost of ES adoption, but also to human resources as a range of various people are involved in the project. These people usually represent the whole company and all levels of its organizational hierarchy.

In consequence, ES adoption is an enormous effort for the organization, connected with a substantial risk of failure and experiencing various conditions. The considerations of ES adoptions may be expressed as critical success factors (CSFs), which represent the limited number of areas of enterprise activity in which the achievement of satisfactory results will ensure competitive performance for the organization (Rockart, 1979). However, existing research works based on critical success factors use various CSF models having different levels of generalization and completeness, which makes a reliable comparison of findings not always possible (e.g. Finney and Corbett, 2007).

The existing literature mostly builds on the experience of developed countries, where most ES developers are located and implementations have occurred (Davison, 2002). However, Huang and Palvia (2001) suggest that ES implementations in developing countries experience specific conditions resulting from both national/environmental characteristics and organizational/internal factors. Also, Roztocki and Weistroffer (2008a) posit that the objectives for IT investments in emerging economies are often very different from those in developed countries. Hence, there is a need to conduct research among ES projects in emerging economies in order to fill the gap in the existing body of knowledge.

Poland is one of emerging economies, classified as a developing country with an upper-middle-income economy (The World Bank, 2010). It is also considered a transition economy, i.e. an economy that is in transition from a communist style central planning system to a free market system (Roztocki and Weistroffer, 2008b). Therefore, conducting research among Polish companies should contribute to the greater understanding of ES adoption considerations in transition economies.

The goal of this study is to identify and better understand critical success factors (CSFs) for enterprise system adoptions among transition economies. The analysis builds on exploratory research conducted among Polish enterprises which had implemented ES. The study identifies CSFs through careful analysis and categorizations using grounded theory approach and then performs a stakeholder analysis of revealed CSFs in order to evaluate stakeholders' criticality. Next, the findings were discussed and compared with CSFs reported by prior studies conducted in developed and developing countries.

## RESEARCH METHODOLOGY

The goal of this paper is to answer the following research questions:

- What are the critical success factors for ES adoption in the case of Polish companies?
- How does the perception of critical success factors for ES adoption vary depending on different stakeholder type?

This study's objective is to draw a theory on the basis of information gathered from the people located at the source of the issues investigated. Therefore, in order to discover the critical success factors for ES adoption in emerging economies, a qualitative approach based on grounded theory was adopted (e.g. Charmaz, 2006; Corbin and Strauss, 1990; Glaser and Strauss, 1967). This decision has been made in order to avoid the risk of using misspecified research designs, since adopting one of prior CSF models, which were typically elaborated and used in developed countries, we may not encompass essential conceptual differences between developed and emerging economies (Hoskisson, Eden, Lau and Wright, 2000).

This exploratory study is based on data gathered from practitioners dealing with ES implementation or involved in an ES package operation in various companies in Poland. During the research, a semi-structured questionnaire was employed as a data-gathering method. In order to gain the broadest possible understanding of the issues examined, semi-structured questions were asked in order to allow the respondents to freely express their thoughts in an unconstrained way. Specifically, in order to elicit critical success factors for ES adoption the respondents were asked to describe what issues had the greatest influence on ES adoption success in their companies. The questionnaire also contained other items with the purpose of gaining insight into companies' business background and gathering demographic data about the inquired people and investigated projects and companies.

During the process of data analysis, open coding procedure was applied (Corbin and Strauss, 1990), where the respondent statements were compared and analyzed in the search of similarities and differences. The statements were given conceptual labels and categories and subcategories were created. Next, the process of axial coding was performed, during which the relationships between categories and subcategories which emerged during the process of open coding were tested against data and verified. After referring to data source, it turned out that some initial subcategories may be merged or moved to other categories.

During the research, companies located in southern Poland were addressed and 164 opinions were gathered from respondents who expressed their thoughts about 139 adoption projects introducing ES into their firms. In general, in each researched company one ES implementation project was conducted. In several cases, a number of respondents within the same organization expressed their opinions about an ES project, hence the number of respondents is greater than the number of companies. Practically all inquired respondents were present in their companies when an ES project was conducted. The investigated companies include organizations of various size who were operating in a variety of industries and employed various system solutions.

The respondents were diverse as regards their role in the implementation process. Their roles, starting from the most popular, include member of the Project Team, Project Manager, member of the Steering Committee, and system user (Table 1). Simultaneously, 14 percent of respondents did not play any defined role during implementation project; however, in general, these people were present in the company during the ES adoption project run. Therefore, they should have insight into the characteristics of the ES adoption project conducted in their organization.

Role in the adoption	n
member of the Project Team	69
Project Manager	31
supervisor/member of the Steering Committee	24
none/lack of direct participation	24
user	16

**Table 1. Respondents by Role in the ES Adoption**

Freeman (1984) defined a stakeholder as "any group or individual who can affect or is affected by the achievement of the firm's objectives". Within the context of ES adoption, a natural groups of stakeholders are formed by the project participants and employees of the company. This study adopts the definition and grouping of stakeholders on the basis of their role played during the adoption project (defined in Table 1).

## RESULTS

### Critical Success Factors Elicited

As a result of research, 279 answers which pinpoint critical success factors have been gathered. In consequence of the analysis, 20 critical success factors have been elicited. Also, 4 categories have been revealed that put together the extracted factors into groups. Table 2 contains names of the factors and their categories. For each factor and factor category, a percentage of respondents declaring a given factor as critical for his/her adoption project successfulness has been given in an appropriate column. The factor categories and factors were presented in descending order of frequency.

CSF Category	CSF	% of Respondents
employees		0.50
	employees' attitudes	0.17
	top management support	0.14
	management personnel attitudes	0.10
	employees' characteristics	0.09
adoption participants		0.49
	project team	0.24
	provider	0.15
	implementation participants' attitudes	0.06
	IT department	0.03
	project manager	0.02
adoption project run		0.33
	determination	0.07
	training	0.07
	project management	0.07
	cooperation	0.05
	communication	0.05
	visible benefits	0.02
adoption preparation		0.30
	project definition	0.10
	project preparation	0.09
	system and fit	0.05
	company's condition	0.03
	organizational changes	0.03

**Table 2. Critical Success Factors and CSFs' Categories**

In consequence of analysis, revealed CSFs were grouped into 4 categories which are connected with company's employees, implementation participants, adoption project run, and company's preparation for ES adoption. The core category is connected with organizational aspect of the adoption project and may be labeled "Enterprise system adoption organization & management". The extracted factor categories have been discussed in the following subsections.

#### Category "Employees"

This category embraces issues connected with generally understood employees of a company adopting an ES. It refers to employees at practically all levels of company management and includes the following factors:

- *Employees' attitudes* – generally understood company's employees are involved in the ES adoption project, they are convinced of benefits resulting from ES adoption and reveal positive attitudes such as determination, positive stance and willingness to cooperate within the project.

- *Top management support* – members of top management are determined to implement the system, are involved in the adoption project, support the project and exert pressure on employees in order to effectively adopt the system.
- *Management personnel attitudes* – management personnel exert pressure on employees to complete the project successfully, are involved in the adoption and have a positive attitude towards the project.
- *Employees' characteristics* – company's employees have high professional qualifications and knowledge of company's functioning and information systems; it is beneficial if they have experience gained in previous implementation projects.

#### *Category "Adoption participants"*

This group refers to adoption participants, i.e. people directly involved in the adoption project. They are first and foremost company's employees, however, external people may also appear. The following factors are included:

- *Project team* – implementation team consists of carefully selected, competent and responsible employees, who are actively involved in adoption tasks; project team work is efficient and well organized, project team members are determined, possess knowledge and experience.
- *Provider* – system and implementation services provider is competent and knowledgeable; there is a good cooperation between provider and adopting company; provider supports and is involved in the adoption project.
- *Implementation participants' attitudes* – employees taking part in the project are involved in adoption duties, are experienced in company's processes, are determined to complete the adoption project.
- *IT department* – members of IT department are determined and involved in the adoption project, they are a competent and well organized team.
- *Project manager* – project manager is a person who is experienced in ES implementation and knows the adopted system.

#### *Category "Adoption project run"*

This category comprise issues connected with the implementation project run and concerns the following factors:

- *Determination* – during the project run there is a determination to succeed; it is generally believed that the adoption is necessary and attitude towards success prevails.
- *Training* – during the adoption project an intensive training is conducted with appropriately selected participants; training is a means to overcome barriers and convince employees of benefits resulting from the system adoption; if necessary additional training is organized.
- *Project management* – the adoption project is well managed which relates to immediate problem solving, preparing documentation, controlling costs, and motivating participants.
- *Cooperation* – during the project there is a cooperation inside the organization between company departments and between employees and the project team; cooperation also relates to organizations outside the company and manifests itself in the support from other units of the company or from organizations that had adopted the system.
- *Communication* – during the adoption project there is a good communication between the project team and company's management and employees; employees are continuously informed of the project and resulting consequences for them.
- *Visible benefits* – during the project benefits of system adoption appear relatively soon, they concern the improvement of work conditions and effectiveness.

#### *Category "Adoption preparation"*

This category concerns issues connected with the preparation of a company to an ES adoption project. It includes the following factors:

- *Project definition* – ES adoption is preceded by a careful project definition which includes a correctly planned project schedule allocating adequate time for the adoption; an appropriate implementation strategy is defined, preferably proved in other companies conducting similar business activities; employees prepare documentation of company's processes.
- *Project preparation* – a thorough project preparation includes pre-implementation analysis when a company's condition is precisely analyzed; a well-thought-out system and implementation partner's choice is made; project preparation is performed early enough and is phased in time.

- *System and fit* – a selected enterprise system fits the company’s needs, has a user friendly interface and possibility to extend its functionality.
- *Company’s condition* – a company is in a good condition and well organized, demonstrates the high level of technological development, has a good computerization and development strategy.
- *Organizational changes* – organizational changes are performed along with ES adoption; business processes are being improved.

### Stakeholder Analysis

The following section analyzes responses connected with critical success factors of ES adoption across different stakeholder groups.

#### CSF Evaluation by Respondent's Role

Table 3 contains revealed CSFs depending on respondent role in the adoption. The presented numbers contain percentage of stakeholders who recognized given factor as critical for ES adoption success. In order to increase readability, 3 to 6 (depending on stakeholder) topmost factors in each stakeholder group were marked in bold.

CSF Category / CSF	Respondent's Role in the Adoption					
	none	user	project team member	project manager	supervisor	overall
employees	0.50	0.38	0.48	0.58	0.54	0.50
employees' attitudes	<b>0.21</b>	<b>0.19</b>	<b>0.20</b>	0.06	<b>0.17</b>	<b>0.17</b>
top management support	<b>0.21</b>		0.10	<b>0.26</b>	0.13	<b>0.14</b>
management personnel attitudes	0.04	0.13	0.07	<b>0.16</b>	<b>0.17</b>	<b>0.10</b>
employees' characteristics	0.04	0.06	0.10	0.10	0.08	0.09
adoption participants	0.58	0.44	0.57	0.39	0.38	0.49
project team	<b>0.29</b>	<b>0.25</b>	<b>0.26</b>	<b>0.23</b>	0.13	<b>0.24</b>
provider	<b>0.17</b>	0.06	<b>0.17</b>	0.10	<b>0.17</b>	<b>0.15</b>
implementation participants' attitudes	0.04	0.13	0.09		0.04	0.06
IT department	0.04		0.01	0.06	0.04	0.03
project manager	0.04		0.03			0.02
adoption project run	0.33	0.31	0.32	0.35	0.33	0.33
determination	0.04		0.07	0.06	0.13	0.07
training	0.08	0.06	0.06	0.10	0.04	0.07
project management	0.08	0.06	0.06	0.10	0.04	0.07
cooperation	0.04		0.07	0.06	0.04	0.05
communication	0.08	0.06	0.06	0.00	0.04	0.05
visible benefits		0.13		0.03	0.04	0.02
adoption preparation	0.17	0.50	0.29	0.39	0.21	0.30
project definition	0.04	<b>0.31</b>	0.04	<b>0.13</b>	0.13	<b>0.10</b>
project preparation	0.04	0.13	<b>0.12</b>	0.06	0.04	0.09
system and fit		0.06	0.09	0.06		0.05
company's condition	0.08		0.03	0.00	0.04	0.03
organizational changes			0.01	<b>0.13</b>		0.03

Notes: percentage of respondents declaring specified CSFs; topmost CSFs for given stakeholders marked in bold.

**Table 3. Critical Success Factors by Respondent's Role in the Adoption**

Data in the table show that two most often declared CSFs, connected with project team and employees' attitudes, are recognized by practically all stakeholder groups. The latter is not appreciated only by project managers, while project team is

somewhat underestimated by supervisors. The next highly estimated factor, system and implementation services provider, is recognized as critical by supervisors, members of the project team, and people not directly involved in adoption duties. Then, top management support is perceived by first and foremost project managers and people not directly involved in the project. The two next factors according to overall ranking are connected with management personnel attitudes and project definition. The first is recognized as critical by people supervising and managing the project, while the latter is critical first and foremost for system users, and then to a lesser for project managers.

While analyzing table 3, it is worth to pay attention to factors which are not highly positioned in overall ranking but are regarded as critical by selected stakeholders. These are first and foremost organizational changes, which are regarded as critical by first of all project managers. The second such factor is connected with project preparation, which is particularly regarded by project team members.

#### Stakeholders' Criticality

CSFs discovered during the process of data gathering and analysis often relate to various stakeholders. Sometimes it is a direct relationship which is also reflected in the CSF name (e.g. management personnel attitudes, top management support), but also an indirect reference to stakeholders occurs, like in the case of the factor connected with project definition, which among other things emphasizes the need of project team involvement during the project definition. Therefore, CSFs reported by the respondents where analyzed taking into consideration involved stakeholders. As a result, stakeholders groups were separated and percentages of respondents pointing to given groups depending on their role in the project were calculated (Table 4). Stakeholders were ordered in the decreasing popularity among all respondents (column *overall*).

Stakeholder Involved in CSF	Respondent's Role in the Adoption					
	none	user	project team member	project manager	supervisor	overall
<i>not clearly specified</i>	0.39	0.25	0.42	0.25	0.50	0.37
employees	0.36	0.33	0.26	0.29	0.31	0.32
project team	0.28	0.29	0.26	0.13	0.25	0.25
provider	0.19	0.21	0.10	0.21	0.13	0.17
participants	0.13	0.13	0.16	0.21	0.19	0.15
top management	0.10	0.21	0.26	0.13		0.14
management personnel	0.12	0.04	0.16	0.17	0.13	0.12
external	0.03		0.03	0.04		0.02
project manager	0.03	0.04			0.06	0.02

Note: Expressed as the percentage of respondents who considered factors related to given stakeholders critical.

**Table 4. Criticality of Stakeholders by Respondent's Role in the Adoption**

It should be noted that stakeholder groups discovered here are data-driven and deliver information about emphasis placed on given stakeholder group, they should not be treated as a systematic grouping into non-overlapping sets. Data show that the significance of company's employees for the project is recognized mostly by people not directly involved in the adoption duties and by system users; however, it is underestimated by members of the project team and project managers. The importance of the project team is highly evaluated by all stakeholder groups, except for, which is interesting, project managers. Next, the significance of the system provider is not recognized by the members of the project team and project supervisors. Adoption participants are generally appreciated by project managers and supervisors, i.e. people managing them in the project. The important role of top management is perceived first and foremost by system users and members of the project team. What is interesting, top management itself does not recognized its significance. Overall, company's management personnel does not play any significant role in the opinion of system users. Few respondents indicate a certain importance of external partners (e.g. other company's units) and project manager. The latter is indicated especially by project supervisors.

## DISCUSSION OF FINDINGS

### The Most Important Critical Success Factors

The gathered data indicates that ES adoption in Polish companies are projects where people play the most critical role. Half of questioned respondents reported CSFs connected with company's employees, who represent practically all levels of company's organizational hierarchy, starting from operational workers, through department managers to top management. Also, half of respondents declared CSFs connected to adoption participants, who include first and foremost different groups within the company, but also representatives from the outside appear, such as system and implementation services provider.

Among 8 most often declared CFSs by the respondents as many as 6 are directly related to company's employees or project participants. Three the most critical factors recognized by the respondents include characteristics and attitudes of project team members, positive attitudes of company's employees, and characteristics and performance of implementation services and system provider. Next, there is top management support and not directly connected with people factor emphasizing the importance of a good project definition. However, the next factors are connected with people and embrace characteristics and activities of company's management and employees. The most important factors are supplemented by the necessity of the company's good preparation to the adoption project.

### Stakeholders' Criticality

The gathered data and its analysis allow us to extract main players in ES adoption and initially evaluate their importance. This is illustrated in Figure 1, which presents the most important groups of actors in ES adoption and relationships how given player groups evaluate the significance of other stakeholders. The presence of an arrow indicates that a given group particularly recognizes the importance of a stakeholder pointed by an arrowhead. Additionally, arrows marked with dotted line show supplementing relationships suggested on the basis analysis taking into consideration stakeholders involved in CSFs.

The most important group of actors participating in the adoption include members of the project team, i.e. people responsible for ES adoption at the operational level. The second most important group is formed by generally understood company's workers, who encompass various people from the company generally mentioned by the respondents without clear indication of their organizational position nor the role in the project. Two above-mentioned groups are considered the most critical by the largest number of stakeholders.

Supplementing the relationships by those resulting from stakeholder analysis of CSFs causes the inclusion of ES provider among the most important actors. It is now recognized as a critical player by 5 stakeholder groups. In the same way, top management representatives who supervise the project become a critical player in ES adoption. This body is perceived as a critical actor by 4 stakeholder groups.

What seems to be an interesting finding of this study is the indication of company's employees together with people not actively taking part in the project as very important actors in ES adoption. Other interesting finding includes the poor evaluation of project manager importance, who practically does not clearly appear as a significant actor neither among declared CSFs nor among players emerged as a result of stakeholder analysis of CSFs.





necessity of performing changes in the company, which is to a small extent perceived by the Polish respondents but holds one of the topmost positions in prior literature ranking.

Critical Success Factor*	Rank**	Change <sup>+</sup>
<b>Top management commitment and support</b>	1	≈
Consultant selection and relationship	7	↑
Team morale and motivation	16	↑↑
<b>Change management</b>	2	≈
<b>Project team: the best and brightest</b>	5	≈
Selection of ERP	15	↑
<b>Training and job redesign</b>	4	≈
Implementation strategy and timeframe	6	≈
Visioning and planning	8	≈
Communication plan	11	≈
<b>BPR and software configuration</b>	3	↓
Project management	18	
Build a business case	25	
Project champion	10	
Troubleshooting/crises management	19	
Project cost planning and management	24	
Vanilla ERP	17	
Data conversion and integrity	21	
System testing	22	
Empowered decision makers	26	
<i>Balanced team***</i>	9	↓↓
<i>IT infrastructure***</i>	12	↓↓
<i>Managing cultural change***</i>	13	↓↓
<i>Post-implementation evaluation***</i>	14	↓↓
<i>Legacy system consideration***</i>	20	↓
<i>Client consultation***</i>	23	↓

Notes: \*CSF by Finney and Corbett (2007), topmost in bold; \*\*rank in Finney and Corbett's (2007) study; \*\*\*factors not mapped in this study; <sup>+</sup>denotes change in ranking in this study's results

**Table 5. Mapping This Study's Results on Critical Success Factors Reported by Prior Research**

This study's results partially confirms the findings of prior research conducted among Polish companies. This study reveals that the composition and activity of the project team is the most important CSF for ES adoption, and in the study (Soja, 2010) this issue is one of two discovered determinants of ES adoption among manufacturing companies adopting full-scope ES. Further, the most important determinant is connected with the cooperation with provider, which is an issue ranked at third position by this study. This research shows that ES adoption in Polish companies is an undertaking in which people play the most important role. This confirms the results of (Soja, 2008) which illustrate that problems connected with various people involved in ES adoption are the most serious difficulties during ES adoption in emerging economies.

This research also partially confirms results of prior research in developing countries, however, it additionally reveals some interesting findings. The factors which is perceived as critical regardless the level of national economy development is top management support (Ngai, Law and Wat, 2008). The issue which is typical of developing countries (Huang and Palvia, 2001) and seems to characterize researched projects in Poland is the poor emphasis on BPR and lack of experience in process management. Project management is also to some extent underestimated, which partially characterizes ES adoption projects in developing countries (Ngai, Law and Wat, 2008). However, on the other hand, two other issues characterizing ES adoptions in developing countries, i.e. weak IT maturity and financial problems resulting from usually small company size, do not seem critical for investigated Polish companies. Finally, this study's respondents do not recognize as important issues related to cultural differences, which are typical of developing countries rather from Far-East Asia (e.g. Davison, 2002).

### Limitations and Further Research

This study has an exploratory nature and as such is subject to several limitations and requires further research. The main limitation is connected with research sample which is not random; however, it contains a quite numerous group of various companies delivering valuable exploratory findings. Further research may focus on the better verification of the proposed CSFs model and conducting a multi-method research combining qualitative and quantitative approaches. Also, the use of success measure in the analysis of investigated projects may allow us to evaluate the influence relationship and to discern determinants of ES adoption success.

Further research may focus on the verification of stakeholder grouping, which is at the moment initially designed for the identification and illustration of roles played by various groups of actors and their mutual relationships. As a result of further research a better stakeholder structure and clustering may be revealed. Also, other possible strand of research is to complement the researched stakeholder groups by the representatives of external partners in ES adoption. Finally, further works may deal with an issues as to how do adoption type and company's characteristics influence CSFs for ES adoption.

### CONCLUSION

This study examines critical success factors for enterprise system (ES) adoption and builds on the experience of ES adopters from Poland, which is an example of a transition economy. Using a grounded theory approach the recognized CSFs are divided into categories and subjected to stakeholder analysis. Next, the CSFs reported by Polish practitioners were compared with the results of prior research conducted in developed and developing countries. This study's findings suggest that the most important CFSs for ES adoption in transition economies are connected with people playing different roles in the implementation project and also emphasize different criticality of various stakeholders. This study's results may be beneficial for practitioners managing ES adoptions, who may better satisfy various stakeholders' interests. The findings also suggest the importance of further work in order to investigate the determinants of ES adoption success.

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