

Change Management in Information Systems Projects for Public Organizations in Poland

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Abstract

It can be argued that public organizations, in order to provide the public with sufficient services in the current, highly competitive and continuously evolving environment, require changes. The changes that become necessary are often related to the implementation of information systems (IS). Moreover, when organizations are faced with changes, a change management (CM) process needs to be put in place. CM theories that are currently available to practitioners and academics are often contradictory; they mostly lack empirical evidence and are supported by unchallenged hypotheses concerning the nature of the contemporary CM. The aim of this paper is, therefore, to identify critical success factors (CSFs) for CM in IS projects. In order to reach this aim an explanation of changes in public organizations and the nature of CM are presented. Following this, a framework of CSFs for CM in IS projects are identified based on the literature review. The paper also examines two IS projects and uses them to demonstrate CSFs influencing CM in IS projects in Polish public organizations. A discussion of the research findings is provided and the paper concludes with a presentation of the study's contributions and limitations as well as the stream of future work.

Keywords: project management, change management, public organizations, information systems, IS, critical success factors, CSF

Introduction

Currently, public organizations are often confronted with the need to implement changes to existing processes. This need is often connected with transformation that takes place in public management and the implementation of information systems (IS) (Boyne, Farrell, Law, Powell, & Walker, 2003; Kickert, 2007; Ongaro, 2010; Pollitt & Bouckaert, 2011). The literature provides various examples of failure of large and complex IS projects (Goldfinch, 2007; Loukis & Charalabidis, 2011), and in many cases, the reason for IS implementation failure is a lack of change management (CM) (Aladwani, 2001; Momoh, Roy, & Shehab, 2010; Somers & Nelson, 2001;

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Umble, Haft, & Umble, 2003). CM provides a solution to two major problems: how to plan better for the implementation of changes and how to overcome employee resistance (Anderson & Anderson, 2001) to these changes. CM refers to a set of basic tools or structures intended to keep any change effort under control (Hornstein, 2014).

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Traditionally, the theory of CM has been based on research cases for business organizations (Stewart & Kringas, 2003; Thomas, 1996). The prior studies on CM did not concentrate on the specific contextual characteristics of public organizations (Kuipers et al., 2014). However, an interest in CM in public organizations has been noted (Fernandez & Pitts, 2007; Fernandez & Rainey, 2006). Recent studies have questioned the fact that CM techniques for the private sector are applicable in the public organization context and have suggested that the differences between the public and private sector could play a significant role in this respect (Boyne, 2006; Karp & Helgø, 2008; Kickert, 2013; Klarner, Probst, & Soparnot, 2008; Rusaw, 2007). Roughly they involve different environmental, organizational, and process related factors (Caudle, Gorr, & Newcomer, 1991). Several authors have suggested that the specific context of public organizations may have consequences for CM, but there is little empirical evidence concerning this issue. A recent literature review of research on CM in the public sector by Kuipers et al. (2014) found that most studies emphasize the content and context of change, instead of the implementation process. Moreover, researchers conclude that many studies did not address the outcomes or success of a change intervention.

Ubiquitous information systems and implementation of various kinds of changes related with IS adoption have become a challenge for public organizations (Jääskeläinen & Sillanpää, 2013). Public organizations' efforts relate to a successful IS and CM implementation, experiencing various conditions and are connected with a substantial risk of failure. The considerations of IS and CM implementation may be expressed as critical success factors (CSFs) (Rockart, 1979). CSFs represent the limited number of areas of activity in which the achievement of satisfactory results will ensure the success of IS projects in public organizations, also activities associated with CM.

However, the processes through which the change in public organizations comes about are not described in detail in the literature (Kickert, 2010; Kuipers et al., 2014). The existing research work mostly examines CM in IS projects in business organizations only. The authors of this paper, after extensively searching the literature, could not find any significant studies concerning applying CM in IS projects in public organizations. This portrays the need for studying how CM should be used in IS projects in public organizations and how it affects the success of these projects. This research holds the promise that conducting research among Polish public organizations should contribute to greater understanding of the use of CM in IS projects and should help fill the gap in the existing body of knowledge.

In light of the above limitations, the objective of this study is to identify CSFs for CM in IS projects in Polish public organizations. To reach this objective, an explanation of CM is offered, especially in the context of IS projects. A literature review is conducted with specific focus on CSFs for CM. Next, two IS projects in public organizations in Poland are presented, the employment of CM in these projects is shown and the CSFs for those CM in the projects are identified, and a discussion of the research findings is provided. This paper concludes with a presentation of the study's contributions and limitations, and the stream of future works that may arise.

Literature Review

Changes Driven by Projects

The literature review strongly suggests that change is an inevitable consequence of implementing various projects (Hornstein, 2014; Serra & Kunc, 2014). A project is a temporary and unique group of activities with the beginning and end in time clearly mapped out and designed to accomplish defined goals (PMI, 2013). Although project management (PM) and CM are derived from different terminologies and different methodologies (Hornstein, 2014), they are, nevertheless,

tightly linked and co-dependent. They also emphasize different sets of skills and competencies (Crawford, & Hassner-Nahmias, 2010).

According to the Project Management Institute (PMI), PM is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. It is accomplished through the application and integration of PM processes such as initiating, planning, executing, monitoring and controlling, and closing (PMI, 2013). PM is the disciplined application of knowledge, skills, tools and techniques to project activities to meet the project requirements (PMI, 2013; Turner & Müller, 2005).

CM is the process, tools, and techniques to manage the people-side of change to achieve the required business outcome. CM incorporates the organizational tools that can be utilized to help individuals make successful personal transitions resulting in the adoption and realization of change (By, 2005). CM contributes to the successful implementation of a wide variety of projects. Not only does project success utilize the traditional measures of project performance but it is also associated with change management (Crawford, Aitken, & Hassner-Nahmias, 2014). Both PM and CM support moving an organization from a current state through a transition state to a desired future state (Lewin, 1947). PM focuses on the tasks to achieve the project requirements. CM focuses on the people impacted by the change.

CM in the context of PM can be examined from two perspectives. The first one describes changes occurring in the project itself, e.g., a change of a project goal or its scope. Each addition or deletion to project goals or to project scope is considered to be a change, whether it increases or decreases the project cost, schedule, or quality (Ibbs, Wong, & Kwak, 2001). In PM context, CM may refer to a PM process wherein changes to the scope of a project are formally introduced and approved. In this context change management in a project is seen as a creation of procedures that enable the implementation and acceptance of changes to the project itself. The other perspective refers to changes which have to be implemented in public organizations before or during implementation of IS projects, e.g., an introduction of a new IS will require changes to procedures or workflow. This paper focuses on CM in this very context, i.e., changes that result from the implementation of IS.

Change Management in Information System Projects

Change management is a process that helps organizations in the implementation of an appropriately planned change (Beekman, Chenhall, & Euske, 2007; Nutt, 1992; Tan & Tan, 2005). CM in the context of IS projects is understood as activities, processes, and methodologies that support employee understanding and organizational aspects during the IS projects (Al-Mudimigh, Zairi, & Al-Mashari, 2001). CM refers to all activities associated with the interaction of technology, processes, and people (Harris, 1999). Academic research has shown that it is not the technology that provides an organization with a success, but the integration of technology into an organizational change management process (Hornstein, 2008). This approach takes into account the importance of people in an organization.

A successful IS project requires, among other things, a human resource strategy to improve the necessary employee skills and their engagement in the process of CM (Hornstein, 2014). Moreover, IS project very often requires reorganization of processes in operation at this point of time. In turn, reorganization of processes is strictly connected with a need to implement the CM concept (Hornstein, 2008; Suman, Ursic, Psunder, & Veselinovic, 2009). Some authors, who also consider public sector changes, point at the fact that these changes may not be more difficult than those in the private sector, but for sure they are different (Cunningham & Kempling, 2009). It can even be stated that CM is a key to success of public organizations IS projects (Higgins, 2005; Umble et al., 2003).

The literature on project success factors has been relatively quiet about the role of change (Turner & Müller, 2005). In addition, PMI, for example, which offers training on project management, does not account for changes brought along with the project. Various practical reports, e.g., The Economist (2009) and PWC (2007), and academic studies suggest that practitioners recognize projects as a structured way to implement business changes (Buttrick, 1997; Kerzner, 2013; Turner, 2009). Nonetheless, CM has continued to have a relatively small representation in the project management literature.

Critical Success Factors for Change Management in Information System Projects

In the literature there are several definitions of CSFs. Leidecker and Bruno (1984) described CSFs as a set of characteristics, conditions and variables which should be adequately sustained, maintained, or managed in order to affect success factors of an organization competing in a specific industry (Leidecker & Bruno, 1984). Rockart and Bullen (1981) defined the CSFs as the restricted number of fields in which positive outcome will result in “successful competitive performance” for employees, organizational units, and an organization as a whole. According to Ramaprasad and Williams (1998), the CSFs should be used in three crucial areas including PM, information systems implementation, and requirements.

CSFs for CM in IS projects have not been much explored in the literature. There are many authors describing CSFs for CM (Averweg & Erwin, 1999; Graetz, 2000; Guimaraes, Ighbaria, & Lu, 1992; Hotek & White, 1999; Palvia & Chervany, 1995; Rothwell & Kazanas, 1998; Underwood-Stephens & Cobb, 1999; Weber & Weber, 2001). However, there are not too many describing CSFs for CM in IS projects.

For the purpose of this study, the CSFs for CM in IS projects have been identified based on the literature review (Table 1). The framework includes CSFs for CM, which are described in the literature on CM, and, moreover, only those that may refer to CM in IS projects have been selected. Further, CSFs defined by particular authors have been analyzed, classified, and unified. The identification of these key factors also allows for measuring the influence of CM on IS project. The authors state the assumption that all factors are equally important and none of them has been prioritized.

Table 1: Critical success factors for change management in IS projects

CSFs	Definition
1. Top management support	Active and visible support from a management team. Involvement and commitment of senior management. Direct participation of the strategic decision makers in an IS project.
2. Recognize the change	The need for change has to be established Promote a positive approach to change
3. Shared vision for change	The vision should be strongly advocated across the organization
4. Planning a project as a change	Evaluation of the gap between where the organization is now and where it would like to be Manage entire change process as a project Prepare a change management plan Promote change in the organization
5. Managerial activity	Involvement of managers who are directly associated with the change process

CSFs	Definition
6. Effective communication	Communicate the change message at all levels throughout the organization
7. Organization readiness to deal changes	Organization needs to be ready to deal with change Employees need to feel that the organization is ready to deal with change
8. Employees training	Clear demonstration how to use IS
9. Employees involvement	Belief the employees that the change is important and has impact on the organization's success
10. Employees satisfaction	Satisfaction with the final product and its acceptability by employees.
11. Information flow	Having readily available and current data gathered in one place and available to all interested
12. Performance measurement	Measure of change performance and value it to employees to demonstrate success

Sources: (Aladwani, 2001; Chrusciel & Field, 2006; Cocks, 2014; Davenport, Harris, & Cantrell, 2004; Graetz, 2000; Guimaraes et al., 1992; Hotek & White, 1999; Sutanto, Kankanhalli, Tay, Raman, & Tan, 2008; Weber & Weber, 2001).

The following paragraphs present a more comprehensive explanation of each of the CSFs presented in Table 1.

Top management support. Top management support helps formulate and establish quality policies and objectives, provides resources and training, oversees IS implementation at all levels of the organization, and evaluates and revises the policy in light of results achieved (Chrusciel & Field, 2006; Sutanto et al., 2008).

Recognize the change. Recognizing the change helps understand what exactly will be changed and whom the change will affect (Graetz, 2000). The change needs to be defined clearly. The appropriate identification of changes determines changes in organization's processes and the employee's tasks and responsibilities. As a result, it sets a direction of organization's development.

Shared vision for change. Shared vision for change is important to direct the system change effort and to serve as a foundation from which specific strategies need to be developed for arriving at a future end-state (Sutanto et al., 2008). The change agents must ensure that the organizational stakeholders understand the vision of how the IS will be able to transform the organization. It is very important to have a clear vision and objectives for organizational success, especially during times of increased uncertainty, such as a change process (Weber & Weber, 2001). It is also very important to understand the current state of the organization that can be viewed as the platform from which the CM plan will launch (Cocks, 2014).

Planning a project. Planning a project as a change involves managing human and other resources. A clearly documented change management process helps make a map of the tasks and resources required (Cocks, 2014).

Managerial activity. Commitment of line managers to CM creates a situation that they identify with a change. They also manage the time of their subordinates accordingly, accounting for their involvement in change processes in their assignments (Chrusciel & Field, 2006).

Effective communication. Effective communication is crucial for effective CM. Without proper communication, the employees involved in the change process would not know what changes were made, what changes are being made, what changes should be made. Moreover, the employees would not be aware of their tasks related to the implemented changes. Communicating the

message repeatedly up, down, and across the organization is necessary to ensure that the momentum and enthusiasm for change does not diminish over time (Graetz, 2000). Communication by top management is seen as a powerful leverage in gaining commitment and building consensus about the required change (Kotter, 1995).

Organization readiness to deal changes. This factor reflects employees' perceptions of the extent to which an organization is ready to make changes to improve performance (Weber & Weber, 2001). Dealing with a change helps provide better understanding of forthcoming changes by employees.

Employees training. Employees' training was identified as important, but it is very subjective in nature (Chrusciel & Field, 2006). Employees' training is a clear demonstration of how to use the IS. After conducting training, employees will gain initial experience with the change, and as a result the initiative will bear an impact on them; they may demonstrate greater understanding and support for management and the planned change effort (Weber & Weber, 2001).

Employees involvement. Employees' involvement is very important in CM success. Employees' involvement is the degree to which employees participate in the improvement activities. By engaging employees in the change processes, they identify more with the success. Employees' participation is a degree to which employees believe they can make decisions about how they perform their tasks and work (Weber & Weber, 2001).

Employees satisfaction. Employees' satisfaction is the precondition for successful change implementation connected with IS projects. Satisfaction is not fully felt until the employees get used to a new IS. At the beginning, there is always a noticeable resistance to change (Smith, 2005). Thanks to the training of employees, the resistance can be quickly overcome. Moreover, the enhancement of information flow on changes diminishes the resistance.

Information flow. Organizations improve their ability to be informed about running a project by providing better access to data (Davenport et al., 2004). Not only should organizations provide access to data, but the available data should be consistent, timely, and accurate. Besides there should be information sent if any changes in data occurred.

Performance measurement. Performance measurement is a critical factor for the success of IS projects (Feurer & Chaharbaghi, 1995; Greiling, 2005). Implementation progress must be measured regularly for more efficient and effective control. Through monitoring and feedback from the users, the performance of the change process can be reviewed and evaluated to see whether it is achieving business goals and objectives.

The literature lacks proven scientific theories and experience on the impact of CM on IS projects in public organizations. Hence, providing CSFs for CM in IS projects in public organizations is becoming an important task. The starting point of defining CSFs for public organizations should be those critical factors already identified for private organizations. The literature provides examples of adapting these factors in public organizations. Most of those factors are the same for the private and public organizations (Caudle et al., 1991; Indeje & Qin, 2011).

Research Methodology

The goal of our research was to indicate CSFs for CM in IS projects in public organizations. In order to achieve the goal, various scientific methods and techniques have been applied, especially a critical analysis of the literature and case studies as well as methods of creative thinking and logical deduction.

To explain the nature of CM and identify CSFs for CM in IS projects, a critical analysis of the literature as well as methods of creative thinking and logical deduction have been used. In order

to present the practical dimension of CM in IS projects in public organizations, a case study approach has been applied. Semi-structured interviews of end-users and project team members were conducted, as well as shareable documentations related to IS projects management were analyzed for the case studies. We also used our extensive practical experience of IS projects and of CM in those projects to guide the research.

The studies related to the IS projects in public organizations and CSFs for CM in those projects were conducted in 2010 and 2013. This involved IS projects in two Polish public organizations projects included development and implementation of integrated IS.

Research Findings

Case Studies of Information System Projects

Public administration in Poland, due to the territorial scope of its operations, is divided into public organizations at the state level embracing the whole of Poland and public organizations at local levels embracing voivodeships (provinces) and districts. The case studies of IS projects considered below refer to the state level, where the project management took place, and the local levels, where the two IS projects were implemented.

The two similar projects, one successful and one not successful, will be used to present the application of CM in IS projects. Information about each project was gathered by participation in those projects and conducting a series of semi-structured interviews. Table 2 shows that the two projects were similar in terms of scope and size, but CM was only used in project B. As a result, the outcomes of the projects were different. Project A ended only as a partial success. Although the IS was finally implemented, it was not fully used by end users after 12 months. The completion of project A was also significantly delayed. Project B was fully successful. The IS was implemented and it is fully used by its end-users.

Table 2: Project A and B – comparison of basic variables

Features	Project A	Project B
Project type	Information system	Information system
Sector	Public administrations	Public administrations
Initial schedule	12 months	18 months
Budget	Realistic	Realistic
Success criteria	On time, within budget, successful installation of ERP system	On time, within budget, successful installation of web-based information system
IS software	Custom made	Custom made
End-users	Public organization employees	General public, Public organizations employees
No of end-users	400	35 000
Project management methodology	PRINCE2 (only few basic documents were created)	PRINCE2 (full documentation needed were created)
Change management	No (changes were introduced ad hoc)	Yes
Project result after 12 months	Software was made but not fully used after 12 months	Software was made and fully used after 12 months

Project A was carried by a public organization at the state level. The aim of the project was to improve and automate government processes and to implement an integrated information system, i.e., an ERP system in sixteen public organizations at the local levels. The ERP system used until this point in time was out of date. The objectives of change were to centralize the management of the organizational structure of all sixteen public organizations and the automation of supporting government processes for finance and accounting, human resources management, payroll management, inventory management, and fixed assets management. The expected benefits of the project (and the change) were to eliminate unnecessary documentation, systemize document circulation, ensure a smooth flow of information, and make information accessible (which is relevant and timely to appropriate users and in an appropriate form). A dedicated project team of the central public organizations was responsible for the implementation of the ERP system. It was composed of IT and government specialists, especially employees from the departments of the central public organization, such as: accounting, human resources, payroll, fixed assets, and inventory management, and from the IT department. Moreover, the project team was supported by people from the IT company specializing in the implementation of ERP systems for public organizations, especially business analysts, systems analysts, and project team leaders.

Project A was managed using PRINCE2 methodology; however, only a few documents were created. There were no documents devoted to risk management and change management. The project team was not fully involved in the project. This meant that the people were not permanently assigned to the project, but involved as needs arose. The particular project members were not clearly acquainted with their role in the project. Neither were they informed about the necessity of new IS implementation, nor about the main goal of IS project. The project team was not always informed about the project status. Moreover, a proper system analysis process was omitted. The end-users did not have the opportunity to express their needs and expectations towards IS. This caused that the all project team members had a negative attitude to the project and approached the implemented change reluctantly. They were strongly opposed to the forthcoming changes and wanted to postpone them. The system end-users, who were not the members of the project team, also were not informed about the IS change. The change was authoritatively imposed upon them by their superiors just before the project implementation. As a result, the implementation of the system was extended. This was caused by the lack of coherent schedule that would have coordinated the IS implementation in sixteen public organizations.

Project B was also carried out by a public organization at the state level. The aim of the project was to implement IS for supporting processes of service provision for citizens. As a result of the project the following types of IS were implemented: integration platform, business intelligence, enterprise portal, web based information portal, and mobile terminal software. The project was undertaken as a consequence of the diagnosed problems arising from the lack of IT system integration. The lack of integration made it impossible to have quick access to information indispensable for effective functioning and monitoring of operations of public organizations and caused an ineffective flow of information between the public organizations and the cooperating institutions. The lack of system cooperation compounded the difficulties in monitoring funds allocation and expenditure and the difficulties in monitoring the use of funds by individual public organizations.

Project B was managed using PRINCE2 methodology, where all necessary documents essential for effective project management were created. The project team was formally established. Particular people were permanently assigned to particular parts of the project. The scope of their responsibilities was explicitly defined. The project team consisted of an IT specialist group and a government group made up of specialists who were the main users of the system. Change management was conducted concurrent with the project implementation. The end-users participated in a series of conferences where a clearly defined project goal and successively accomplished tasks were presented. Moreover, they actively participated in system analysis meetings where they de-

fined the system requirements. The project had a coherently worked-out schedule that also included a project team meeting schedule. The project team was kept informed about the project progress and participated in the final IS testing.

Change Management in Information System Projects

As mentioned, CM was not tested in project A, and the necessary changes were implemented ad hoc, whereas CM was applied to project B in a methodologically correct manner. Table 3 shows the CM evaluation for the two IS projects in the relation to the CSFs identified in Table 1.

Based on the examination of the case studies, the authors can draw the same observations. Obviously, it can be stated that in case of project A, where only 2 of 12 CSFs listed were met, the lack of CM could have contributed to the failure of IS project. Finally, IS was created and implemented with a significant delay. Besides, within 12 months after having completed the implementation, the users did not take advantage of the IS's full capacity. In case of project B, 11 out of 12 CSFs were met. It can be assumed that those factors played a significant role in the IS project's success. Project B was completed on schedule.

Effect of Change Management on Information System Projects Success

The study investigated two projects, one successful and one not successful. The fact that the successful one implemented CM and the unsuccessful one did not, in itself is not proof that implementing CM will guarantee success. However it is worth considering that implementing CM can contribute to the project success. The research was based on two case studies and the reports published by the project managers in both cases. Although these sources primarily reflect personal views, it should be stated that project managers and whole project teams are valuable sources of knowledge on IS projects, also in terms of their success or failure. CSFs analyzed in the paper are also considered as preconditions for CM success by other researchers. This demonstrates that the factors described in this paper may accurately reflect the state of practice of CM in IS projects.

As the presented case studies showed, the application of CM bore an influence on the IS project success, though, it should be kept in mind that project success and CM success are different terms. A project success is measured against a project's overall achievement of the project's objectives (Cooke-Davies 2002; De Wit, 1988; Drury-Grogan, 2014). PM success is mostly based on budget, schedule, and requirements goals (Cooke-Davies, 2002; Serrador, 2013). CM success reflects the implementation and acceptance of change by people. IS project success depends on two variables, namely, sound project management and CM application. At the same time, it is worth stressing that CM mainly focuses on human factors.

The involvement of top management and line managers in the change process is as important as the involvement of end-users whom the changes concern most. The careful mapping out of the change process and its further consistent implementation are key success factors too. The continuous flow of information during a project is also of high importance, especially the flow of information from managers on specific successive steps of the change as well as the feedback from end-users on the evaluation of the implemented change.

Table 3: CM evaluation for Project A and Project B

Change management CSFs		Project A		Project B
1. Top management support	-	Top management not fully aware of the complexity of IT project Steering committee formed – but meets infrequently Support of top management not visible	✓	Top management fully aware of the complexity of IT project Steering committee meets regularly Visible top management support
2. Recognize the change	-	Need for change has not been established	✓	Need for change has been established
3. Shared vision for change	-	No vision of change	✓	Vision of change regularly promoted on the meeting with employees at various levels of the organization
4. Planning a project as a change	-	Project was not planned as a change process	-	Project was not planned as a change process, however there was awareness of the need for change
5. Managerial activity	✓	Managers associated with the change process were involved	✓	Managers associated with the change process were involved
6. Effective communication	-	Communication was not sufficient End-users were not involved in the change process End-users were not informed about the change	✓	Communication was sufficient End-users were involved in the change process End-users were informed about the change
7. Organization readiness to deal change	-	Change was not clarified to employees Dedicated user teams were not created to define and implement IS	✓	Change was clarified to employees Dedicated user teams were created to define and implement IS
8. Employees training	✓	Group of employees has been trained in the use of IS	✓	Employees were trained in project management methodology Group of employees has been trained in the use of IS
9. Employees involvement	-	Employees were not involved in the change process Very low level of user acceptance	✓	Employees were involved in the change process Group of interest was created and employees were involved in requirement gathering
10. Employees satisfaction	-	Very low level of user acceptance User dissatisfaction manifested	✓	Users start to see value in integrated systems
11. Information flow	-	There was not information source Neither were the participants of the project informed, nor information was provided outside about the project performance	✓	There was created information source There was created document repository Updates about project were sent to end-users
12. Performance measurement	-	Performance was not measured	✓	Performance was measured, and progress of the project was indicated
Counts of yes			2/12 = 17%	11/12 = 92%
Results		<ul style="list-style-type: none"> • Project was accomplished with a significant delay • IS has been implemented, but after 12 months passing from the implementation it is not used at its full capacity by the end-users 		<ul style="list-style-type: none"> • Project was accomplished on schedule • IS has been implemented and it is used at its full capacity by the end-users

Project A did not have the flow of information. Firstly, the top management was not kept informed about the state of project implementation, the barriers encountered, or the risk threat. Secondly, the end-users were not aware of the fact that the IS they were using would, in a short period of time, be changed and that they would have to start working with a new IS. Only the line managers were informed and involved in the change. Despite the fact that they showed a proactive and positive attitude to the forthcoming change, there was a lack of top-down process coordination. In some fields work on the project was completed quickly and efficiently, whereas in others, due to the lack of current information, the accomplishment of specific tasks took longer. All this had negative influence over the whole IS project.

A methodological approach to the change was applied in project B. Relevant information, which was passed to the top management on a regular basis and also to the end-users, was taken care of. Regular conferences were organized for the end-users, where the state of project implementation was presented and the subsequent IS project stages for the nearest period of time were indicated. The end-users were informed about the scheduled date of system implementation and how their previous work would change. The changes made the work even more efficient and accounted for the needs raised by the employees.

To summarize, the result of the case studies may be used to indicate that an IS project will be much more successful if CM methodology is used and defined CSFs are met. This in turn means that public organizations and their managers should pay closer attention to integrating the IS PM with CM. Although, one should always bear in mind that CM success depends on PM success.

Conclusion

This study contributes to the research of CM in IS projects in two ways. Firstly, the identification of CSFs for CM in IS project was made. Twelve CSFs have been identified, namely: (1) top management support, (2) the change recognition, (3) shared vision for the change, (4) planning a project as a change, (5) managerial activity, (6) effective communication, (7) organization readiness to deal with the change, (8) employees' training, (9) employees' involvement, (10) employees' satisfaction, (11) information flow, (12) performance measurement. Secondly, it showed practical issues concerning those identified CSFs and, consequently, the effect of CM on IS project success.

This study suggested that the relation between CM and IS projects is one of the important determinants of a successful IS project. On the one hand, the timely and effectively managed an IS project is optimized by CM. On the other, a change is an inevitable consequence of IS project implementations.

Although the identified CSFs for CM in IS projects and its practical implementation are generic and comprehensive, a limitation of this study lies in the fact that it is based on only two case studies, which examines only Polish public organizations. The replication of this study for a greater number of IS projects in public organizations in Poland will be useful to enrich the body of knowledge related to the factors bearing an impact on CM in IS projects.

Furthermore, this research can be useful for other Central and Eastern European countries as these countries are similar in many aspects. Their similarity concerns their analogous geopolitical situation and their joint history, traditions, culture, and values. In addition, the similarity reflects in building democratic state structures and a free-market economy, participating in the European integration process, the levels of information systems implementation in public organizations. In addition, they have to resolve the same problems and overcome the same political, economic, social, and technological obstacles in their transition from a traditional government to a government based on information systems. In this research government units and government authorities

could find knowledge related to the factors impacting on successful information systems projects in public organizations.

Moreover, the issues of CFSs of CM in IS projects in public organizations should be explored in greater depth. There is a need to conduct research, especially into (1) improvement of processes in public organizations after change implementation and (2) exploration of ‘best practices’ to be used to manage IS projects successfully. This will be considered as future work.

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