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**An analysis of ERP and CRM system implementations
in Poland between 2013 and 2016**

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Abstract

ERP and CRM management information systems constitute one of the most popular IT system groups used by enterprises, not only in Poland. From the point of view of both theoreticians and practitioners of business informatics, it is important to understand the effectiveness of IT implementation projects in Poland in comparison to similar projects in other countries. The scope of this article is to present the results of research concerning the success and failure in ERP and CRM implementation projects in medium and large enterprises in Poland. The results answer the question regarding the level of effectiveness in selected IT projects consisting in standard implementation, roll-out, upgrade, vertical solution implementation and re-implementation in enterprises based in Poland between 2013 and 2016. The study analyzed 917 projects, including 747 projects in medium enterprises and 224 in large enterprises. The research shows the structure of fully successful, partially successful and completely failed projects following the classical evaluation of IT projects. Research results show that the level of effectiveness in IT projects consisting in implementations of management information systems is slightly higher in Poland than in analogous projects studied by the Standish Group. Importantly, despite technological progress and efforts of research centres, consulting companies and software producers, the effectiveness of IT project completion has not increased for over 20 years. The results may be interesting for researchers specializing in the subject of IT project completion, as well as for practitioners implementing such projects.

Keywords: ERP, CRM, effectiveness, success, failure, IT project.

JEL Classification: L86, M15.

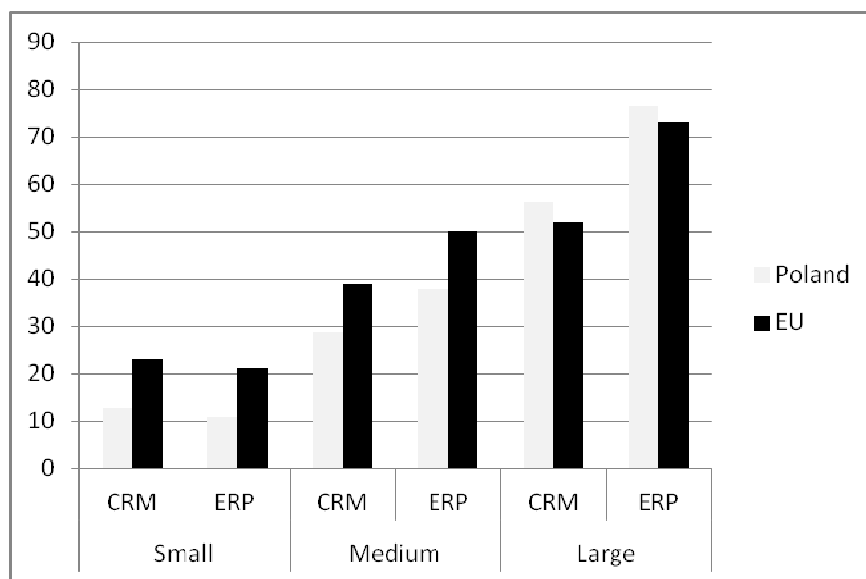
Introduction

This article is aimed at analyzing the effectiveness of IT projects consisting in the implementation of ERP and CRM management information systems in medium and large enterprises in Poland. The author has chosen this specific group of IT systems as, according to his research, ERP and CRM systems are the most popular management support systems in Poland. Figure I presents the structure of CRM and ERP system usage in Poland and the 28 EU countries, divided between three groups of enterprises:

- small enterprises – with 10-49 employees;
- medium enterprises – with 50-249 employees;
- large enterprises – with over 250 employees.

This structure shows that small and medium enterprises in Poland use both ERP and CRM systems more rarely than enterprises in other EU countries. On the one hand, this indicates a significant market potential and on the other hand – the importance of this subject matter.

Figure 1. The structure of ERP and CRM system usage in specific enterprise groups in Poland and the EU



Source: Based on: The Central Statistical Office (GUS) and Eurostat (in case of ERP systems, the information dates back to 2013; in case of CRM systems – 2012).

The effectiveness of Management Information System implementation projects is an important research area that has been analyzed for a few decades. In the late 1970s, the U.S. Government Accounting Office revealed that more than

a half of all software purchased by the government had never been used, and less than 3% had been used in the form that it had been provided in [U.S. Government Accounting Office 1985]. A report by KPMG shows that in over 20 years in private and public sector organizations in Canada, 60% of studied IT projects were unsuccessful, more than 75% exceeded the planned completion time and more 50% exceeded the budget [IT Cortex 2005]. A 2015 report by Panorama Consulting Solutions states that amongst ERP implementations in the USA, 75% of projects were completed after the deadline. The report indicated that the three main causes of delays were: unrealistic implementation plan agreed on during the first, preparatory stage of the project, extending the project scope during its completion in relation to the scope agreed upon in the first stage, and technological problems. Comparing the actual and planned expenditure showed that as many as 55% of projects exceeded the original budget [Panorama Consulting Group 2015]. Referring to analyses by B. Czarnacka-Chrobot [2009], it is worth noting that interesting results were also obtained by a 2007 study on European IT industry carried out by HP in cooperation with the Economist Intelligence Unit amongst over 110 IT employees [Żółcińska 2007]: IT projects were most likely to be completed on time in Swedish companies, where reportedly 44% of implementations were finished according to schedule, with only 4% of timely project completions in Belgium, Spain, Netherlands and Italy. Additionally, 57% of respondents believed that less than 50% of projects brought positive business results. Research conducted in 2004 in Poland by IT Investment Consulting demonstrates that about 53% of all MIS implementation projects are failed investments.

Considering the above information and the number of enterprises using ERP and CRM management information systems in Poland, the research question on the effectiveness of ERP and CRM implementation projects appears to be valid.

The scope of this article is to present the results of research concerning the effectiveness of ERP and CRM implementation projects between 2013 and 2015. In order to analyze the problem, the author has chosen the survey method. The first part of the article discusses the nature of effectiveness in completing implementation projects from the perspective of literature. The second part presents research methodology. The next part focuses on discussing and interpreting the results, followed by final conclusions.

1. Theoretical background

Effectiveness is understood as an activity yielding the desired results, producing the expected outcome, useful, efficient or one that brings results [*Słownik języka polskiego PWN* 1995]. Looking at effectiveness, we focus on the end

results. According to T. Kotarbiński, effectiveness consists in expected measures leading in a foreseen way (not by accident) to an intended goal. A minimally effective action, meanwhile, occurs when the predicted effectiveness is high enough for such actions to be worth undertaking (the value of results prompts us to act) [Zieleniewski 1969]. The nature of an IT implementation project's life cycle means that we need to analyze the effectiveness of its completion both directly after the end of an MIS implementation and during system usage. Classical project management assumes that the desired implementation results include completing the project:

- on time.
- on budget.
- achieving the planned functional and technological scope of the implemented IT system.

Thus time, cost and scope are seen as the basic determinants of success in IT system implementation.

The completion time results from a certain 'attachment' to typical methods of problem-solving in project management, where giving the start and end date for the project was a condition necessary to achieve results in the methods used (especially network analysis methods). Project costs are linked to the available resources. The scope applies both to the goals and limitations of the category that the project applies to. The above-mentioned elements form the so-called triple constraint or the iron triangle of project management. The area between the corners of the triangle (defined as time, cost and scope) contains a solution acceptable for the supplier, but not the optimal one. The values optimal for each project are the limit values designated by the combination of the values of the corners in the triangle. Thus, defining two values means that the third value is the result value, and changing one of them results in changing the remaining values. Hence, shortening the completion time leads to a change in costs and scope, which means either increasing or decreasing them [Chmielarz 2013]. According to the classical approach, a successful project should be completed on schedule and on budget and the undertaken actions should lead to defined goals: the achievement of planned functional and technological scope of the implemented IT system. Adding extra dimensions to the evaluation of project's success goes against the traditional approach to project evaluation.

The classical approach does not provide for any potential future benefits of project completion, the company's goals or any other conditioning. An implementation project is treated as a separate enterprise, whose success is equal with the completion of initial assumptions. In this case, the definition of success is clear and is included in the definition of effectiveness and efficacy of the work

carried out by the project team [Jasińska 2016]. This approach allows us to quickly qualify a given project as successful or not, and in IT implementation projects it is the right approach to diagnose the effectiveness of an implementation as such, i.e. its success or failure. However, in order to see the full image of an IT project implementation, we need to analyze the achieved benefits and the influence that system usage has on the organization. Although treating an implementation project as a separate venture would make the evaluation of its success easier, ‘no project is an island’, as stressed by M. Engwall, which means that it belongs to a set of conditions characterizing a given organization and its environment [Engwall 2003, pp. 789-808]. To quote W. Chmielarz, project success in its classical sense and project success (and management) in the contemporary understanding resulting from practice differ considerably. From the classical perspective (assumed by many studies), success is understood as not exceeding the costs (and preferably meeting the costs), full compliance of the schedule with project deadlines and of the completed project scope with its specifications. Adding the perspective of the end user (client) means that we need to consider more criteria of project success: the question of client’s satisfaction with the received product or services. Adding a dynamic environment means decreasing the risk of uncertainty and increasing ability, effectiveness, flexibility, adaptability, functionality, etc. – which is very close to the evaluation of a successful project management in an organization.

The most complex study in the area of IT project implementation analysis is research conducted systematically by an American institution the Standish Group since 1994. We need to stress that the international IT industry considers this organization to be a credible and objective supplier of statistical data concerning the success of IT projects. Their research is conducted on the basis of information collected from 50,000 IT projects. Projects participating in the Standish Group research vary in size – from small to large.

The Standish Group conducts research and analysis from the perspective of success factor, including the degree of compatibility between the function and characteristics of the project’s product and the requirements included in the users’ specification. Table 1 presents the distribution of success in IT project completion from the period between 2011 and 2015. Projects completed with full success (so on budget, on time, with the implementation of all the functional requirements) represent the percentage success. It is worth noting its low value during the eight years of research. In 2012, only 39% of IT projects ended in full success. The successful projects are counterbalanced by:

- failed projects: complete failure;
- problematic projects: partial failure.

According to the Standish Group's research history, presented in Table 1, between 2011 and 2015 the average success rate equaled 29%, which means that on average 71% of IT projects failed completely or partially.

Table 1. Success structure rates in IT project completion

IT projects	2011	2012	2013	2014	2015
Successful projects (completed on budget, on time, all the required functionalities implemented)	29%	27%	31%	28%	29%
Failed projects (abandoned and never completed)	22%	17%	19%	17%	19%
Problematic projects (delayed, exceeding the budget, not all the required functionalities implemented)	49%	56%	50%	55%	52%

Source: Based on: [Chmielarz 2013].

It is worth taking a look at the previous Standish Group research results from the last 22 years. In Table 2, the author presents Standish Group's research results from the period between 1994 and 2015.

Table 2. Retrospective analysis of Standish Group research between 1994 and 2015

Year	Success rate	Failure rate
1994	16%	84%
1996	27%	73%
1998	26%	74%
2000	28%	72%
2002	34%	66%
2003	33%	67%
2004	29%	71%
2006	35%	65%
2008	32%	68%
2010	37%	63%
2011	29%	71%
2012	27%	73%
2013	31%	69%
2014	28%	72%
2015	29%	71%

Source: Based on: [Chmielarz 2013].

Research shows that over the last 20+ years, the success factor in IT projects remained on a level between 16% and 37%. The high failure rate was caused by assuming quite a restrictive assumption that each failure is a deviation

from the basic parameters of the project (e.g. exceeding the budget, not keeping the deadlines, not completing the full scope of work); however, even considering this, the level of failure is curiously high [Chmielarz 2013]. Unfortunately, it does not decrease with time: the average success rate equals 29%, despite technological progress and the intense development of IT project organization in the area of science and practice.

2. Research methods and procedure

In his research, the author used the survey method in a group of medium and large enterprises based in Poland. The research was carried out between 2013 and 2016. The subject of research were both Polish and foreign enterprises, which implemented ERP and CRM systems between 2008 and 2016. In large enterprises, the respondents included directors of IT departments, operations directors and finance directors. In medium enterprises, the study was carried out amongst company chairmen, general directors and finance directors. During the surveys, the author came across many types of IT implementation projects which had been identified and characterized by the author in his previous research. The author, to ensure the credibility of answers given by the respondents, provided each questionnaire with information that he would use the classical definition of project success in his research, explaining in detail what it means. Before completing the research, the author contacted the respondents directly or by phone in order to complete a brief training.

The IT implementation projects covered by the research included [Wachnik 2016]:

1. Standard implementation. Completing this type of implementation project consists in implementing a standard ERP or CRM system. It is most often completed in companies that shape their IT strategy – defining their operating activities, including those linked to managing MIS – independently and autonomously. Such organizations are free to select an IT system and supplier, as well as the functional, technological and organizational scope of the implemented system. Standard implementations are most common in Polish companies or in highly autonomous branches of foreign companies.
2. Roll-out implementations. This type of MIS implementations are completed in branches of international corporations or in divisions of local enterprises, for example in service points in different parts of the country, which have to adjust to the company's central IT strategy and operating activities linked to maintaining and developing the entire IT infrastructure. These enterprises are

not fully free to select an MIS, its functional, technological and organizational scope or supplier. Consequently, they have to implement standardized business processes, reports and analyses, as well as interface, aligned with other information systems in the reference model (core) designed by the parent company. A roll-out implementation consists in adapting and implementing a reference model of an MIS containing specific requirements of the local branch, resulting from the character of business processes and legal requirements.

3. System upgrade to a newer version. Implementing a new version of a system is called an upgrade project. The end result of an upgrade project is launching a new version of the same MIS, and consequently modifying the organization of business processes.
4. Implementing a vertical solution. A vertical solution (add-on) of a standard MIS consists in enhancing it with additional functionalities required by a given industry or enterprise group, completed by a software producer or another company. Hence, a standard ERP or CRM system is expanded with new functions, reports and interface required by a given industry (e.g., Life & Science).
5. Re-implementation. These projects cover a group of IT projects that were terminated by the suppliers or clients during the implementation. Some of the clients whose IT project failed would nevertheless like to complete the investment in order to draw benefits of an MIS. For this reason, some clients decide to re-implement an IT system.

Amongst the studied implementation projects, 98% were completed on the basis of outsourcing, i.e. using an external supplier of services, while the remaining 2% were completed on the basis of internal human resources. As part of his research, the author has posed the following research question:

What is the effectiveness structure in the completion of IT projects consisting in the implementation of ERP and CRM systems in medium and large enterprises based in Poland in the period between 2013-2016?

Between 2013 and 2016, the author completed survey research concerning the distribution of success rate in IT implementation projects consisting in the implementation of ERP and CRM systems. The author attempted to study a sufficient number of IT projects in order to achieve representative results for the researched phenomenon amongst medium and large enterprises in Poland. In order to achieve this, the author estimated the number of enterprises from the MLE group which implemented ERP and CRM systems up until 2013; the results are presented in Table 3.

Table 3. The estimated number of enterprises which implemented ERP and CRM systems

Enterprise definition	General number of enterprises in Poland in 2013	Percentage penetration of ERP and CRM system use in both enterprise groups*	The number of enterprises which implemented ERP & CRM systems up until 2013
Large over 250 employees	2,915	ERP – 75%	2,186
		CRM – 55%	1,603
Medium between 50 – 250 employees	17,332	ERP – 39%	6,759
		CRM – 29%	5,026

* Based on: The Central Statistical Office (GUS) and Eurostat (in case of ERP systems, the information dates back to 2013; in case of CRM systems – 2012).

Table 4 presents the structure of the researched objects.

Table 4. The structure of studied enterprises

Enterprise size	Type of MIS system	An estimated number of enterprises in Poland owning a given MIS type in 2013	Number of studied enterprises
Large	ERP	2,186	196
	CRM	1,603	189
Medium	ERP	6,759	209
	CRM	5,026	206

In the period 2013-2016, the author studied the total of 971 IT projects, including 747 projects in medium enterprises and 224 in large enterprises. The sample of studied enterprises presented, equal to the number of studied IT projects, allows for a 90% confidence level, with a 5% margin of error. The research method proposed by the author included restrictive assumptions in project evaluation similar to those of the Standish Group, where any deviation from the basic projects assumptions, i.e. exceeding the budget or the schedule and not achieving the full project scope, was considered a failure.

3. Research findings and discussion

Table 5 presents the results of research carried out in large enterprises. According to the data presented in Table 5, success rate in ERP implementations equaled 44%, while in CRM implementations it equaled 53%, which means that on average 48.5% of IT projects are successful.

Table 5. Success structure rates in IT project completion in large enterprises

Specification	ERP	CRM
Successful projects (completed on budget, on time, all the required functionalities implemented)	44%	53%
Failed projects (abandoned and never completed)	21%	16%
Problematic projects (delayed, exceeding the budget, not all the required functionalities implemented)	35%	31%

Table 6 presents the results of research conducted amongst medium enterprises. According to the data presented in Table 6, the success rate in case of ERP implementations equaled 48% and in case of CRM implementations 47%, which means that on average 47.5% of IT projects end successfully.

Table 6. Success structure rates in IT project completion in medium enterprises

Specification	ERP	CRM
Successful projects (completed on budget, on time, all the required functionalities implemented)	48%	47%
Failed projects (abandoned and never completed)	19%	18%
Problematic projects (delayed, exceeding the budget, not all the required functionalities implemented)	33%	35%

Table 7 presents the average rate of exceeding the planned costs, schedule and compliance of the delivered product with its required scope in partially failed projects completed in large enterprises.

Table 7. The average percentage by which the cost, time and compliance of the delivered product with its required scope were exceeded in the analyzed IT projects implemented in large enterprises based in Poland

Analyzed parameters of project completion effectiveness	Average percentage by which the analyzed parameters were exceeded in ERP implementations	Average percentage by which the analyzed parameters were exceeded in CRM implementations
Schedule	42%	38%
Budget	35%	29%
Functional & technological compliance with product requirements	18%	25%

Table 8 presents the average rate of exceeding the planned costs, schedule and compliance of the delivered product with its required scope in partially failed projects completed in medium enterprises.

Table 8. The average percentage by which the cost, time and compliance of the delivered product with its required scope were exceeded in the analyzed IT projects implemented in medium enterprises based in Poland

Analyzed parameters of project completion effectiveness	Average percentage by which the analyzed parameters were exceeded in ERP implementations	Average percentage by which the analyzed parameters were exceeded in CRM implementations
Schedule	35 %	37 %
Budget	29 %	30 %
Functional & technological compliance with product requirements	16 %	23 %

Table 9 presents the average percentage by which the planned costs, completion time and the compliance of the delivered product with its required scope were exceeded in partially failed projects, according to research carried out in 2004, 2006, 2008, 2010 and 2010 by the Standish Group.

Table 9. The average percentage by which the cost, time and compliance of the delivered product with its required scope were exceeded

Analyzed parameters of project completion effectiveness	Average percentage by which the analyzed parameters were exceeded in IT project completion
Schedule	24 %
Budget	47.6 %
Functional & technological compliance with product requirements	31.60 %

Source: Based on: [Chmielarz 2013].

4. Interpretation of research results

It is worth noting that although the Standish Group does not clearly state that they analyze IT projects consisting in the implementation of MIS, instead defining the analyzed projects as software development investments, we can assume that these are in fact management support software systems, including ERP and CRM systems, as well as other MIS-class systems, on the basis of the type of end users and the conclusions resulting from the research. The author's research covered only ERP and CRM systems, thus an attempt to compare these two studies may not present a clear and credible image. However, in the author's opinion, it can be interesting both for theoreticians and practitioners, indicating a cognitive map of the analyzed phenomenon. We need to stress that this is the first time a study of this kind was conducted on such a big sample of enterprises in Poland.

To sum up the research results, it is worth pointing out that the average success rate in ERP and CRM implementations in large enterprises in Poland equals 49%, while in case of medium enterprises it is 48%. By comparison, the average success rate in the Standish Group research between 2011 and 2015 equaled 28.8%. It is noteworthy that the success rate is significantly better than the success rate defined by the Standish Group between 1994 and 2005, when it equaled 29%. Figure 2 presents a comparative analysis of the structure of successful, failed and problematic IT projects in medium and large companies in Poland and in the Standish Group research.

Figure 2. The structure of successful, failed and problematic IT projects in medium and large enterprises based in Poland, and in the Standish Group research

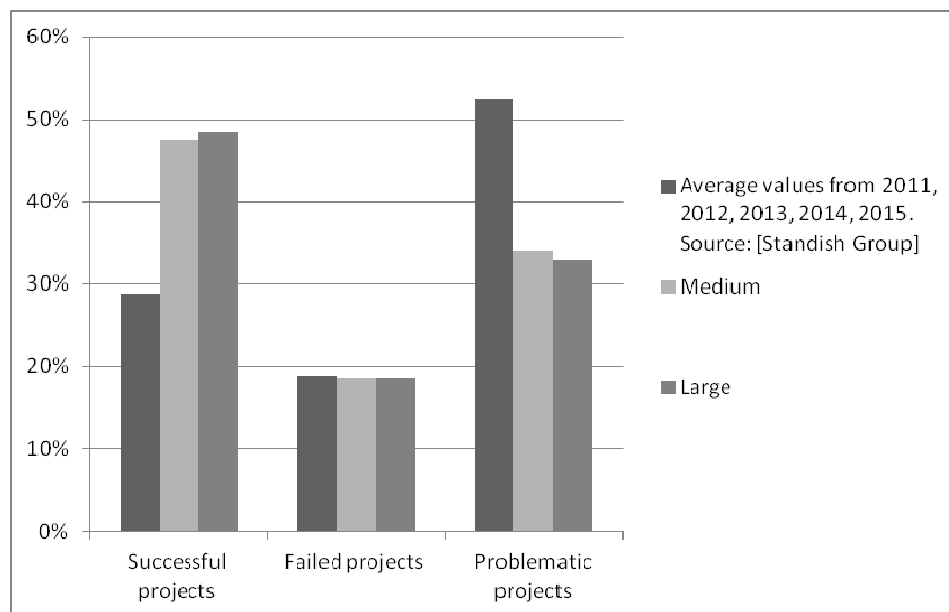
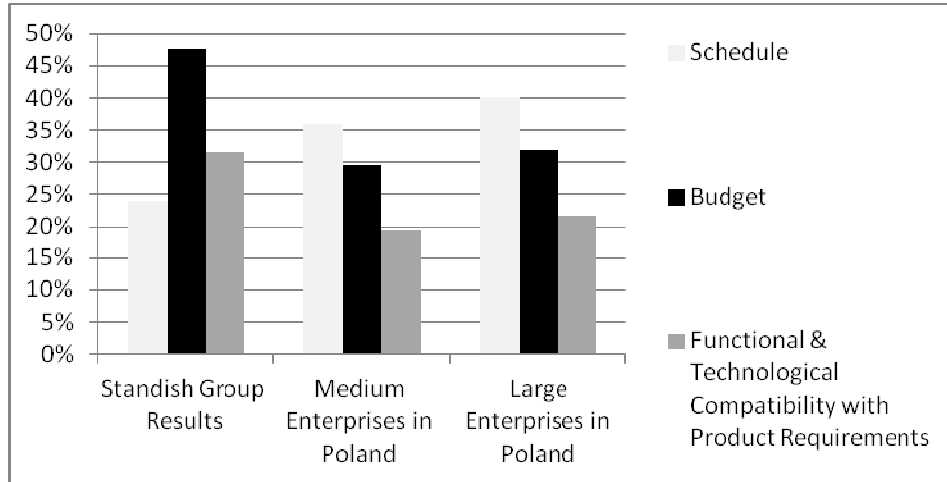


Figure 3 presents the average percentage by which the planned cost, schedule and compliance of the delivered product with its required scope were exceeded in projects that ended in partial failure in medium and large enterprises based in Poland, and in Standish Group studies in 2004, 2006, 2010 and 2012.

Figure 3. A comparative analysis of the average deviation from criteria in project evaluation in IT projects studied by the Standish Group and ERP and CRM implementations in medium and large enterprises based in Poland



In this period, the planned cost was exceeded in medium and large enterprises based in Poland by the average of 31%. This means that if a company owner decided to purchase an ERP or CRM system, whose implementation service budget was initially on the level of 100,000 PLN, then probably during the implementation they had to pay an additional sum of 31,000 PLN. This will be the cost of implementing functionalities that had not been originally planned for or designed. By comparison, an analogous cost was exceeded by the 48% average in the Standish Group results.

Conclusions

The conducted research concerns 971 selected IT projects consisting in implementations of the most popular ERP and CRM systems used by enterprises in Poland and internationally. It is the first time that such a large sample of IT projects has been analyzed in Poland, hence the author would like to stress the unique character of his research. The author, however, would also like to point out the limitations of his research:

1. Despite the analyzed sample being representative of the studied enterprise group, the author believes that the number of researched projects, especially in the medium-sized enterprise group, poses a limitation.
2. Classical criteria of evaluation have been considered, i.e. not exceeding the budget, compliance with the schedule and compliance of the completed work

with the scope included in project specifications; the effectiveness of IT projects within 2 to 4 years of ERP or CRM project launch has not been considered.

3. The correlation between successful or partially failed projects and return on investment within 2 to 4 years of system launch has not been studied.

Research indicates that the scale of effectiveness in IT project completion is still low, both in Poland and internationally. We need to stress here that one of the reasons for it is the assumption of classical evaluation criteria, i.e. not exceeding the costs, maintaining the original schedule and the compliance of the final scope of work with project specifications. However, despite the progress of technology and an enormous effort on the side of research centres, companies and software producers to analyze this phenomenon, the effectiveness of IT project completion has not been increasing for over 20 years. In terms of IT project completion, it is worth noting research by Charette [2005, pp. 42-49], K. Ewusi-Mensah [2003] and R. Glass [2001; 2002]. We can also point to interesting articles by Polish authors: B. Kubiak and A. Korowicki [Szyjewski, Grabara, Nowak (eds.) 2003], T. Lis and S. Nowak [Grabara, Nowak (eds.) 2002] as well as J. Szych [2000a; 2000b], J. Skalik and A. Strzelczyk [2013], B. Czarnacka-Chrobot [2009] and P. Soja [2007, pp. 98-114], as well as fragments of books by J. Kisielnicki and H. Sroka [2005], W. Chmielarz [2013] and E. Ziemba [2015, pp. 199-214; Ziemba (ed.) 2015] dedicated to the subject. These authors directly or indirectly touch upon the subject of IT project completion. Additionally, on the basis of the above research, we can conclude that the effectiveness of IT project completion in Poland, where MIS are implemented, is slightly higher than in analogous projects studied by the Standish Group. According to the author, the difference in success rates of IT projects in Poland and other countries may be subject to further research linked to the character of IT projects in Poland compared to other countries [Themistocleous, Soja, Rupino da Cunha 2011], both in the former Soviet bloc and in the developed countries. To sum up, the author believes that the presented research results should not be treated as universally applicable to other countries or regions. According to the author, the unique character of ERP and CRM implementations in a given country significantly influences the effectiveness of implementation projects in that country.

The presented research results constitute a basis for further research aimed at answering the following questions:

1. What is the effectiveness of analogous IT projects in the most developed countries of the EU, i.e. in Germany, France and Scandinavian countries, compared to the former USSR and Soviet bloc countries?

2. Will partially failed or successful IT projects bring return on investment or significant economic benefits to enterprises within 2 to 4 years of system launch?
3. What is the correlation between individual characteristics of IT projects in specific countries and the effectiveness of IT projects according to the classical approach?

The author hopes that the research results presented in this article will help achieve two goals – present a synthesized vision of effectiveness in ERP and CRM implementations in medium and large enterprises in Poland, and contribute to understanding the character of ERP and CRM implementations in Poland from the perspective of general MIS implementation research.

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