UDC 005.5:334.7:004.42(497.5)
Preliminary Communication

Critical Success Factors Aspects of the Enterprise Resource Planning Implementation

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Abstract

Considering a global importance of small and medium sized enterprises (SMEs) they are in the spotlight of ERP implementation retail stores. Many of the relevant studies indicate the importance and diversity of the ERP implementation process. This paper presents results of the authors' research of the implementation success factors from the point of view of implementation participants. Based on the experience of a number of ERP implementations, authors compare the Croatian and international implementing practice of ERP solutions, taking into account the same critical success and the same ERP solution. The emphasis is put specifically on the three key participants in an implementation process: CEOs, project managers and successful-advanced users. Regardless of the relatively limited number of end users who took part in this study, it indicates a significant coincidence of Croatian and international practices in the part of perception of the critical success factors for ERP implementation, but also different views of key participants in the successful implementation.
Keywords: ERP, CSFs, Croatian ERP, Implementation, SMEs, ERP Implementation, Croatian SMEs

1. Introduction

Small and medium sized enterprises (SMEs) include 99 % of all companies in Europe. Their contribution to European GNP is more than two-thirds and they ensure 75 millions of workplaces in the private sector. Therefore small and medium sized enterprises are ones of key factors in the implementation of renewing the Lisbon Strategy, i.e. that part of strategy which refers to the economic development and employing [31].In Croatia, small and medium sized enterprises make 99,4 % of all registered companies, 64,7 % of all employed, 44 % of the gross domestic product and 40,5 % of the total export [29].

Definition of small and medium sized enterprises, in Croatia, has been adjusted with the European Commission, and has been applied from January, 1st 2005, as follows [30]:

- small enterprises are:
  - number of employees, less than 50,
  - the financial criterion, 10 to 50 million €, or up to 10 million € balance properties,
- medium enterprises are:
  - number of employees, less than 250,
  - the financial criterion, 50 to 250 million €, or up to 43 million € balance properties.

In accordance with the deposit, small and medium sized enterprises have to change focus in the market, lower manufacturing costs and improve their competitiveness.

Given a wide range of benefits in term of functionality, many people believe the Enterprise Resource Planning (ERP) system can provide strategic competitive advantages.

ERP systems are complex cross-functional information systems that are designed to improve organizational performance and competitiveness by streamlining business processes and eliminating duplication of work and data [17]. ERP implementation is different from traditional system development because ERP systems integrate all enterprise information systems. Their implementation affects or may require a radical change of organization business processes. ERP systems are expensive systems that require a great effort of implementation. They involve many users from top to low level enterprise, and may influence large number of processes across the organization [18].

However, the estimation of Standish Group International is that 90% of SAP R/3 projects run late and indicate that ¾ of ERP projects were considered as failure and can't be accepted [10]. Accordingly mentioned, researches, consultants and companies have looked for ways of improving chances of successful implementations.

This paper presents results of the study of critical success factors of ERP implementation in small and medium-sized companies in Croatia. Critical success factors (CSFs) for implementations of ERP in a SME environment may differ as compared to ERP implementations in large enterprises. At the same time, we are focusing on Croatia. The approach to ERP implementation shouldn't be copied from one country to another [24].

As a part of the study, questionnaires were sent to 120 companies in Croatia. Their CEOs, project managers and advanced end-users were supposed to respond to the questions. Previously referenced studies related to critical factors of implementation have generally not taken into account the key participants' opinion about the implementation and it is a difference in methodological approach of this study.

2. Critical Success Factors of ERP Implementation: a literature review

Critical success factors of ERP implementation are a frequent topic of scientific research. Therefore, a preliminary study included aims and conclusions of the relevant literature over the last six years. The articles from various sources and article database were analyzed. Critical success factors of ERP implementation projects in the literature are discussed from various points of view. Thus, a number of studies is related to the grouping of the success factors; tactical factors [4], [9], organizational readiness [3]. Some other articles are related to research in small and medium sized enterprises of their own countries or regions [12], [26], [5], [8], [13], [15], [6], [23], [7], [28], [1], [14] [21]. Iskanius elaborates an interesting approach to risk management through the management of the whole ERP project (procurement management, communication management, human resource management, quality management, cost management, time management, risk management and project scope management). Ojala et al. propose measurements of the implementation maturity in a particular way are presented separately by the model IS / ICT [22]. We have also suggested in previous research a checking the ABCD Check list and by CMMI methodology in terms of self-assessment [20]. There are several interesting approaches to the critical factors of implementation in terms of ERP acceptance. Particularly interesting is the approach by using a group of 18 factors, each of which has several sub-factors [19]. There are several papers that approached to the success of the implementation from the aspect of knowledge management. Vandaie emphasizes the importance of organizational knowledge management for a successful ERP implementation done by project team. It refers to the whole life cycle of implementation in the process-oriented ERP environment [27].

There are numerous studies which were focused on the literature review on the critical success factors of ERP projects. Kronbichler and Ostermann propose 78 success factors of implementation within the 15 main groups of factors and their distribution within pre-implementation, implementation and post implementation phases [16]. The paper of Aloni et al. [2] shows 19 most common risk factors collected in four journals (Emerald, Science Direct (Elsevier), Springer and IEEE Xplore). These 19 risks ware associated to 10 effects that will finally cause even 4 groups of effects on the macro level. The compilation of Huang [11] treated 524 papers in the period from 1998 to 2007. That period is divided into two terms: the first from 1998 to 2002 and the second from 2003 to 2007. There is a noticeable increase in

number of articles about CSFs in the second term, and the highest increase in that period was noticed among articles that were thematically related to the education and training of clients. The article presents the 10 most important CSFs for that ten-year period.

3. Research Methodology

Our preliminary study has included a set of 340 bibliographic sources. We prepared a list of CSFs that appeared in them. There was a total of 81 CSFs. After analyzing these factors, we opted for all factors that in the analysis had a share greater than 20%. In this way, the questionnaire had 32 critical success factors of implementation that had to be ranked according to the Likert's scale ranging critical (1) very high (2), high (3), weak (4) and low (5). The questions referred to the totality of the implementation process, and the entire lifetime of the implementation. The questions were emailed to 120 companies in Croatia. At the same time there was created a program on the web which users were able to fill in and which by the appearance was identical to that in a Word document. The choice of a Word document and its completed version sending back via e-mail was due to the realization that this approach results in greater success in terms of completed and returned questionnaires. Based on the experience of a large number of implementations that we had, we know that the knowledge of the totality of implementation and their key problems are differently viewed among participants. For this reason the same questions were put to CEOs, ERP implementation Project Managers and the group of more advanced users who participated in the process of implementation. Based on this, we set up two research questions:

- to which extent CSFs ranking list based on the literature corresponds to the situation in Croatian companies and
- to which extent the answers connected to the importance of 32 CSFs among three examined groups are the same, or to what extent it is necessary to prepare different implementation tactics for the three groups.

The questionnaires were sent out in early February 2012. Respondents were given a time period of almost two months, so that the collection of responses was completed in late March of the same year.

4. Analysis and Interpretation

Questionnaires were sent to 120 companies that use ERP software from different vendors. Participation of ERP software vendors in the sample was as follows: MS Dynamics (Navision) 24,2%; EXACT Max 30%, SAP 5,8 %; Pantheon 11,66 %; IQ 19,17 %; Bann 2,5 %; Point 4,17 % and Ritam 2,5%.

We expected responses from CEOs, project managers and advanced users. In above mentioned period it arrived:

- 60 responses from CEOs,
- 80 responses from project managers and
- 72 responses from advanced users.

Among the companies from which we got one or more questionnaires, 67% are manufacturing companies, while 33% are service providers and telecommunication companies. Among the individual respondents, 27% are employed in small companies (less than 50 employees), and 73% in medium-sized companies (up to 250 employees).

What is particularly worrying is the distribution of responses to the question about the length of the implementation process. It is important to point out that as a criterion for the completion of the implementation process was set successful execution of the MRP process and the application of its results for more than three months. Over 65% of respondents to this

question answered by a statement that the implementation process lasted more than 6 years. Most likely, the application of ERP solutions began much earlier, but the application of MRP in the part of suggesting job orders and purchase orders apparently began much later.

All respondents said that they had been following some of the proposed methodologies, although the questionnaire contained an option and that there was no methodology followed. 89% of respondents answered affirmatively to the question if there was a person who fought particularly hard for the ERP project.

4.1 Summary analysis of factors according to the Likert's scale

There was an analyses made for all three groups of users based on all 32 answers according to critical factors (level 1 –critical, is multiplied with 5, the following with 4 and so on). Standard deviation is calculated for every question in each group.

CEOs considered critical a bit less than 18% factors. They find 7 out of 32 listed in the questionnaire not critical (complexity of architecture and a large number of modules for implementation, communication within the organization, monitoring and evaluation of the effectiveness, performance evaluation and management, use of vendors tools, the use of external consultants, and training and education of users (spread in time)). What is a bit surprising within these 7 factors is the CEOs' opinion that the training and education of users is not a very critical factor.

According to CEOs' opinion first three places are reserved for analysis and motivation for the need of ERP, the involvement and participation of users, and a full understanding of the key issues related to the ERP implementation. The first two factors are critical 50%, and the third a little less than 42%.

The key critical factors for project managers are the top management support (40%), the analysis and motivation for the need of ERP (32%) and the approach and methodology of implementation (28%). Project managers believe that only the use of external consultants is not a very critical factor.

Project managers find in their responds only a use of external consultants as the non critical factor.

The key critical factors for advanced users are the analysis and motivation for the need ERP (40%), a clear vision and business goals (36) and with 32% careful selection of ERP solutions, top management support and change management. The existence and the involvement of the project board and the use of external consultants for this group of respondents do not represent a critical factor.

Advanced users find two factors not critical, steering committee of project ERP implementation and use of external consultant.

Table 1 represents the division of 5 groups of factors. It shows opinion of three chosen groups of respondents according to Likert scale division.

Responses	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
CEOs	17,97	35,68	34,64	10,42	1,30
Project manager's	23,44	37,03	29,22	9,69	0,63
Advanced user's	26,22	38,89	25,52	8,85	0,52

Table 1: The result of the questionnaires completed by the three groups of respondents

Table 1 reveals that the lowest criticism comes from CEOs, the highest from advanced users while Project managers are in between. Based on the results shown in the table, it can be concluded that all three groups of users evaluate an average of 20% of the proposed factors as critical. The difference between CEOs and advanced users is nearly 46%, which in terms of keeping the effectiveness of the implementation is a factor that should seriously be taken into consideration. The same results are shown in graph form in Figure 1.

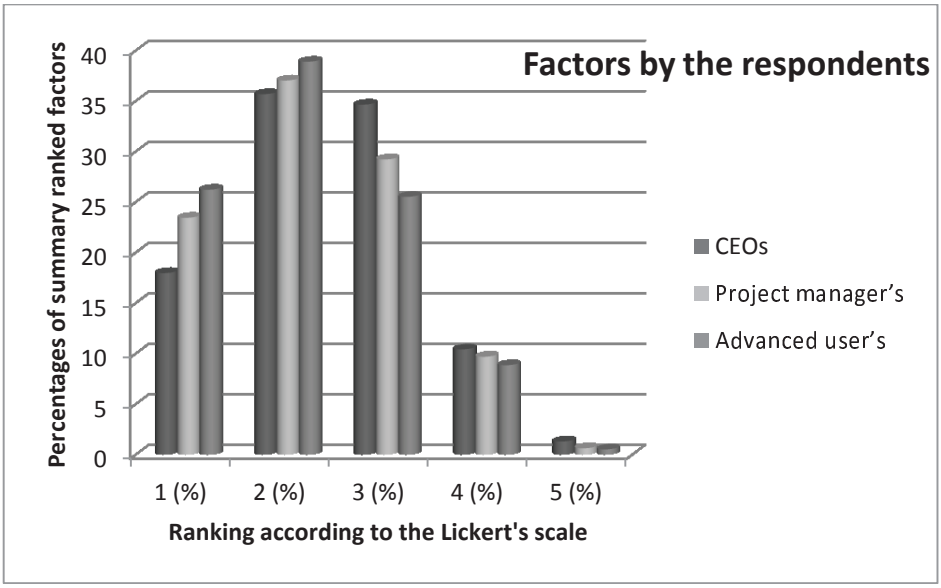

Figure 1: Factors by the respondents

As already mentioned the focus is only on the factors that, according to the Likert scale are marked as critical (1). Table 2 shows the percentage of criticism at all critical success factors of implementation.

Rank list number	Critical success factors of ERP implementations	CEOs%	Project managers %	Advanced users%	Average value %
1.	Analyses and motivates the need for ERP	50,00	45,00	55,56	50,00
2.	Top management support	33,33	50,00	44,44	43,39
3.	ERP software package selection	33,33	50,00	44,44	43,39
4.	Clear goals and objectives	25,00	25,00	50,00	33,49
5.	User Involvement & participation & competence	50,00	10,00	33,33	29,24
6.	ERP does not treat as a project	25,00	20,00	38,89	27,83
7.	User acceptance	25,00	35,00	22,22	27,83
8.	Change Management	16,67	20,00	44,44	27,36
9.	Project Management	16,67	30,00	33,33	27,36
10.	Understanding key problems of ERP implementation	41,67	15,00	22,22	25,00
11.	ERP system quality	25,00	30,00	22,22	25,94
12.	Organizational fit	33,33	15,00	27,78	24,53
13.	Implementation approach & methodology	8,33	40,00	27,78	26,89
14.	Data Management	16,67	20,00	38,89	25,47
15.	User training and Education (timely defined)	0,00	35,00	38,89	26,42
16.	Vendor support	8,33	35,00	27,78	25,00
17.	Partnership with vendor	16,67	35,00	16,67	23,59
18.	Management of expectations	8,33	35,00	22,22	23,11
19.	Relationship of business and IT strategy	33,33	20,00	11,11	20,75
20.	Monitoring and evaluation of performance	0,00	30,00	27,78	20,76
21.	BPR& minimum customization	25,00	10,00	22,22	18,40
22.	Software development, testing and troubleshooting	8,33	30,00	16,67	19,34
23.	Interdepartmental cooperation	8,33	30,00	16,67	19,34
24.	Performance evaluation and management	0,00	35,00	16,67	18,87
25.	Organizational Communication	0,00	5,00	38,89	15,09

26.	Use of Vendor's tools	0,00	25,00	16,67	15,10
27.	Team competence & composition	8,33	15,00	16,67	13,68
28.	Steering Committee of project ERP implementation	33,33	5,00	0,00	11,32
29.	Business culture	16,67	5,00	11,11	10,38
30.	Data Conversion	8,33	5,00	16,67	9,91
31.	Complex architecture and high number of implementation modules	0,00	5,00	16,67	7,55
32.	Use of external consultant	0,00	0,00	0,00	0,00

Table 2: Percentage of criticism at all critical success factors of implementation

The average value (av.val.) is calculated according to the equation:

$$Average\ value = \frac{60 \times CEOs\ av.val. + 80 \times Project\ managers\ av.val. + 72 \times Advanced\ users\ av.val.}{(60 + 80 + 72)}$$

If we compare these results with similar studies in other countries, we will conclude that the results are very similar. For example, in the article [25] the authors compared 22 critical factors, many of which are contained in this paper. Among the top 10 in this study, 7 come from the mentioned article. In majority of the analyzed studies Top management support was rated as the first critical success factor. All the research analyzed so far rarely asked the question of Analysis and motivation for the need of ERP. Based on considerable experience in implementing ERP solutions, the authors asked this question because they witnessed a series of cases in which the use of ERP solution or moving to a new ERP solution was perceived as imposed rather than a real need. On the basis of this research it is evident that User Involvement & participation & competence is an important factor in all stages of the implementation process, with the emphasis on participation in the selection of ERP solutions. This factor in global research and all the consulted studies was not treated at all or had not been seriously taken into consideration as it was in this study.

In 10 studies worldwide, mentioned in this study, the use of consultants, which in our case is represented by the Use of external consultant factor, takes the last place no matter the number of questions involved (from 8 to 22),as in our case. Therefore, it refers to independent consultants who are not directly related to solution suppliers.

Based on all these facts, we conclude that the results largely correspond to similar studies in the world.

4.2 Comparison of the responses of all three categories of respondents

A superficial look at the answers suggested little better statistical analysis. Namely, it is necessary to make some of the statistic tests that should give the answer to the second research question: to what extent the answers connected to the importance of 32 CSFs among the three tested groups overlap.

For this purpose, as the optimal test for comparing two categories of respondents was used a z-test. That is to get an answer to what extent responses based on 32 CSFs overlap. Table 3 shows the z-test of comparisons of CEOs (based on 60 answers) and project managers' (based on 80 answers) responses.

Rank list number	Critical success factors of ERP implementations	CEO (60)	Project manager(80)	z-value	p-value	Significa ntly different
1.	Analyses and motivates the need for ERP	0,5000	0,4500	0,5865	0,5575	no
2.	Top management support	0,3333	0,5000	1,9724	0,0486	yes
3.	ERP software package selection	0,3333	0,5000	1,9724	0,0486	yes
4.	Clear goals and objectives	0,2500	0,2500	0	1	no
5.	User Involvement & participation &	0,5000	0,1000	5,2669	0,0001	yes

	competence					
6.	ERP does not treat as a project	0,2500	0,20000	0,7051	0,4807	no
7.	User acceptance	0,2500	0,3500	1,2693	0,2043	no
8.	Change Management	0,1667	0,2000	0,5014	0,6161	no
9.	Project Management	0,1667	0,3000	-1,8202	0,0687	no
10.	Understanding key problems of ERP implementation	0,4167	0,1500	3,5414	0,0004	yes
11.	ERP system quality	0,2500	0,3000	-0,6531	0,5137	no
12.	Organizational fit	0,3333	0,1500	2,5561	0,0106	yes
13.	Implementation approach & methodology	0,0833	0,4000	-4,2055	0,0001	yes
14.	Data Management	0,1667	0,2000	-0,5014	0,6161	no
15.	User training and Education (timely defined)	0,0000	0,35000	-5,1235	0,0001	yes
16.	Vendor support	0,0833	0,3500	-3,6793	0,0002	yes
17.	Partnership with vendor	0,1667	0,3500	-2,4135	0,0158	yes
18.	Management of expectations	0,0833	0,3500	-3,6793	0,0002	yes
19.	Relationship of business and IT strategy	0,3333	0,2000	1,7859	0,0741	no
20.	Monitoring and evaluation of performance	0,0000	0,3000	-4,6609	0,0001	yes
21.	BPR& minimum customization	0,2500	0,1000	2,3704	0,0178	yes
22.	Software development, testing and troubleshooting	0,0833	0,3000	-3,1311	0,0017	yes
23.	Interdepartmental cooperation	0,0833	0,3000	-3,1311	0,0017	yes
24.	Performance evaluation and management	0,0000	0,3500	-5,1235	0,0001	yes
25.	Organizational Communication	0,0000	0,0500	-1,7573	0,0789	no
26.	Use of Vendor's tools	0,0000	0,2500	-4,1833	0,0001	yes
27.	Team competence & composition	0,0833	0,1500	-1,1958	0,2318	no
28.	Steering Committee of project ERP implementation	0,3333	0,0500	-1,9724	0,0486	yes
29.	Business culture	0,1667	0,0500	-4,0730	0,4266	yes
30.	Data Conversion	0,0833	0,0500	0,7951	0,4266	no
31.	Complex architecture and high number of implementation modules	0,0000	0,0500	-1,7573	0,9789	no
32.	Use of external consultant	0,0000	0,0000	0	1	no

Table 3: z-test of comparisons of CEOs and project managers

The results show that the coincidence is at the level of 14 CSFs and a significant discrepancy of responses is at the level of 18 CSFs. The concordance among the top 10 CSFs is at the level of 6 CSFs and a significant discrepancy at the level of 4 CSFs.

Table 4 shows the z-test of comparison of 60 examinees between CEOs and 72 examinees among advanced users.

Rank list number	**Critical success factors of ERP implementations**	**CEO (60)**	**Advanced user (72)**	**z-value**	**p-value**	**Significantly different**
1.	Analyses and motivates the need for ERP	0,5000	0,5556	-0,6373	0,5239	no
2.	Top management support	0,3333	0,4444	-1,3008	0,1933	no
3.	ERP software package selection	0,3333	0,4444	-1,3008	0,1933	no
4.	Clear goals and objectives	0,2500	0,5000	-2,9373	0,0033	yes
5.	User Involvement & participation & competence	0,5000	0,3333	1,9396	0,0524	no
6.	ERP does not treat as a project	0,2500	0,3889	-1,6955	0,0900	no
7.	User acceptance	0,2500	0,2222	0,3752	0,7075	no
8.	Change Management	0,1667	0,4444	-3,4108	0,0006	yes

9.	Project Management	0,1667	0,3333	-2,1795	0,0293	yes
10.	Understanding key problems of ERP implementation	0,4167	0,2222	2,4046	0,0162	yes
11.	ERP system quality	0,2500	0,2222	0,3752	0,7075	no
12.	Organizational fit	0,3333	0,2778	1,3505	0,1768	no
13.	Implementation approach &methodology	0,0833	0,2778	-2,2429	0,0249	yes
14.	Data Management	0,1667	0,3889	-2,8074	0,0050	yes
15.	User training and Education (timely defined)	0	0,3889	-5,4421	0,0001	yes
16.	Vendor support	0,0833	0,2778	-2,8398	0,0045	yes
17.	Partnership with vendor	0,1667	0,1667	0	1	no
18.	Management of expectations	0,0833	0,2222	-2,1727	0,0298	yes
19.	Relationship of business and IT strategy	0,3333	0,1111	3,1095	0,0019	yes
20.	Monitoring and evaluation of performance	0	0,2778	-4,4322	0,0001	yes
21.	BPR& minimum customization	0,2500	0,2222	0,3752	0,7075	no
22.	Software development, testing and troubleshooting	0,0833	0,1667	-1,4244	0,1543	no
23.	Interdepartmental cooperation	0,0833	0,1667	-1,4244	0,1543	no
24.	Performance evaluation and management	0	0,1667	-3,3170	0,0009	yes
25.	Organizational Communication	0	0,3889	-5,4421	0,0001	yes
26.	Use of Vendor's tools	0	0,1667	-3,3170	0,0009	yes
27.	Team competence & composition	0,0833	0,1667	-1,4244	0,1543	no
28.	Steering Committee of project ERP implementation	0,3333	0	5,3181	0,0001	yes
29.	Business culture	0,1667	0,1111	0,9268	0,3540	no
30.	Data Conversion	0,0833	0,1667	-1,4244	0,1543	no
31.	Complex architecture and high number of implementation modules	0	0,1667	-3,3170	0,0009	yes
32.	Use of external consultant	0	0	0	1	no

Table 4: z-test of comparisons of CEOs and advanced users

The results show that the coincidence is at the level of 16 CSFs and a significant discrepancy of responses is at the level of 16 CSFs. The concordance among the top 10 CSFs is at the level of 6 CSFs and a significant discrepancy at the level of 4 CSFs.

Table 5 shows the z-test of comparison of 80 respondents between project managers and 72 respondents among advanced users.

Rank list number	**Critical success factors of ERP implementations**	**Project manager(80)**	**Advanced user(72)**	**z-value**	**p-value**	**Significa ntly different**
1.	Analyses and motivates the need for ERP	0,4500	0,5556	-1,3001	0,1935	no
2.	Top management support	0,5000	0,4444	0,6855	0,4930	no
3.	ERP software package selection	0,5000	0,4444	0,6855	0,4930	no
4.	Clear goals and objectives	0,2500	0,5000	-3,1904	0,0014	yes
5.	User Involvement & participation & competence	0,1000	0,3333	-3,5228	0,0004	yes
6.	ERP does not treat as a project then as a project	0,2000	0,3889	-2,5640	0,0103	yes
7.	User acceptance	0,3500	0,2222	1,7347	0,0828	no
8.	Change Management	0,2000	0,4444	-3,2367	0,0012	yes
9.	Project Management	0,3000	0,3333	-0,4410	0,6592	no
10.	Understanding key problems of ERP implementation	0,1500	0,2222	-1,1465	0,2516	no

11.	ERP system quality	0,3000	0,2222	1,0876	0,2768	no
12.	Organizational fit	0,1500	0,2778	-1,9297	0,0536	no
13.	Implementation approach & methodology	0,4000	0,2778	1,5856	0,1128	no
14.	Data Management	0,2000	0,3889	-2,5640	0,0103	yes
15.	User training and Education (timely defined)	0,3500	0,3889	-0,4964	0,6196	no
16.	Vendor support	0,3500	0,2778	0,9562	0,3390	no
17.	Partnership with vendor	0,3500	0,1667	2,5624	0,0104	yes
18.	Management of expectations	0,3500	0,2222	1,7347	0,0828	no
19.	Relationship of business and IT strategy	0,2000	0,1111	1,5008	0,1334	no
20.	Monitoring and evaluation of performance	0,3000	0,2778	0,3013	0,7632	yes
21.	BPR& minimum customization	0,1000	0,2222	-2,0630	0,0391	yes
22.	Software development, testing and troubleshooting	0,3000	0,1667	1,9301	0,0536	no
23.	Interdepartmental cooperation	0,3000	0,1667	1,9301	0,0536	no
24.	Performance evaluation and management	0,3500	0,1667	2,5624	0,0104	yes
25.	Organizational Communication	0,0500	0,3889	-5,1172	0,0001	yes
26.	Use of Vendor's tools	0,2500	0,1667	1,2578	0,2085	no
27.	Team competence & composition	0,1500	0,1667	-0,2819	0,7780	no
28.	Steering Committee of project ERP implementation	0,0500	0	1,9228	0,0545	no
29.	Business culture	0,5000	0,1111	-1,3949	0,1631	no
30.	Data Conversion	0,5000	0,1667	-2,3407	0,0192	yes
31.	Complex architecture and high number of implementation modules	0,0500	0,1667	-2,3407	0,0192	yes
32.	Use of external consultant	0	0	0	1	no

Table5: Table 7: z-test of comparison of project managers and advanced users

Correspondence between these two groups of respondents is the largest and is at the level of 21 responses while the discrepancy is at the level of 11 responses. Among the top 10 CSFs the overlap is again at level 6 CSFs while significant discrepancy is at the level of 4 CSFs.

Total coincidence by the z-test of comparisons, if we compare all three groups of the z-test is at the level of 5 CSFs, which are:

- analyses and motivates the need for ERP,
- user acceptance,
- ERP system quality,
- team competence & composition, and
- use of external consultant.

When it comes to the second research question, the coefficient of variation indicates values that indicate significant discrepancy of answers to the same questions in all three target groups of respondents. This suggests that in the process of implementation, for them, it is necessary to have different approaches. In doing so, it is important to point out that the biggest overlap is in the responses of project managers and advanced users, at the level of 65.63%, followed by the overlap between the CEOs and advanced user, at the level of 50% and the lowest overlap is in responses of CEOs and project managers, at the level of 43.75%. We find the comparison results among the three target groups of respondents expected. Unfortunately, chronically the least problems during the implementation process are expected by CEOs while the most skepticism is shown by ultimate users, who were presented as advanced users in our study. Encouraging result of this study is the fact that the CEOs recognized the importance of Top management support (among the 5 most important) with very low discrepancy (standard deviation 0.82).

5. Conclusion

This paper presents the results of the study of critical success factors of ERP implementation in small and medium-sized companies in Croatia. The aim of this study was to determine the extent to which the ranking of critical success factors for ERP implementation in Croatia coincides with the experiences of other countries, based on 32 relevant papers. The systematic study of this type done by solution providers (SAP, Oracle, Microsoft, etc.) does not exist. In Croatia such research also has not been done before.

Second objective was to determine the extent of overlapping the views of the CEOS, project managers and advanced users on the key success factors of implementation and their ranking. Based on a set of 340 bibliographic sources and CSFs that appeared in them, a list of 81 CSFs has been prepared. As a part of the study, questionnaires were sent to 120 companies in Croatia. Their CEOs, project managers and advanced end-users were supposed to respond to the questions. Previously referenced studies related to critical factors of implementation have generally not taken into account the key participants' opinion about the implementation and it is a difference in methodological approach of this study.

After analysis, it can be concluded that there are no significant differences between the world experience and Croatian practice and that there are significant variations in the critical success factors of the implementation of these three groups of respondents.

The key contribution of this paper refers to the fact that different participants (CEOs, project managers and end users) need a differentiated approach in the implementation process. This means that the process of implementation of CEOs, the implementation managers and advanced user's needs to be addressed in different ways in order to achieve successful implementation.

The results suggest that for over 65% cases the implementation process took more than 6 years and determination of success of implementation has a special significance. Therefore the success of implementation criterion of ERP for production companies has been set up. It implies successful operation of MRP processes longer than 3 month. We have considered this prerequisite realistic and for production companies extremely important. With regard to the need, as listed, many of company where started with the MRP processing relatively late.

Implementation retail stores and scientists use different approaches to the stages of implementation, considering both: the number of stages and their essence. The continuation of this research should be in-depth analysis at various stages of implementation, with the reduced number of respondents and the same number of questions. There is no doubt that the same success factors of implementation don't have equal weight in all phases.

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