ENTERPRISE RESOURCE PLANNING SYSTEM IMPLEMENTATION: CRITICAL SUCCESS FACTORS THAT AFFECT ERP IMPLEMENTATION IN BOSNIA AND HERZEGOVINA

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Abstract: Enterprise Resource Planning (ERP), is the new generation theme in business, every company need a successful ERP system, but mostly of company that want to implement ERP have many problem, financial and managerial.

This paper tend to analyze which critical success factors affect the ERP implementation in Bosnia and Herzegovina, because unfortunately in this country, there is a lack in information about ERP implementation and many firms have big problem during approaching the new system, and fail in their intents.

Many researchers in developed country, have brought their conclusion about which factors are most affecting ERP implementation, and through their studies it will be much easier to determine what affect ERP implementation in Bosnia and Herzegovina, are the same problem affecting the implementation like in developed country or there are different problems and factors that cause unsuccessful usage of ERP system in companies, and how firms can easily and successful use ERP systems in this country.

Keywords: *Enterprise Resource Planning system, Critical Success Factors, successful implementation.*

JEL classification: *M1, M11, M15, P41.*

Introduction

Enterprise Resource Planning (ERP), is the new generation theme in business. Every company need a successful ERP system, but mostly of company that want to implement ERP have many problem, financial and managerial.

Now a days managers want to know every movement in their company just clicking on their computers, laptops or smart phones, in every moment of the day, they want to control the resources which enter and come out from the manufacturing process, knowing their suppliers, prices, quantity, and quality and of course who is their final customer which uses their products or services. But the problem is: how to reach successfully this "knowing everything" in the company?

Because of too much interest in this field, researchers in enterprise information systems want to make the new theoretical and practical approaches to ERP, and now a days there are so many literature, that try to describe ERP in deep and how to approach ERP and successfully implement the system in companies in every country.

Unfortunately in Bosnia and Herzegovina, because of lack in information about ERP implementation, many firms have big problem during approaching the new system,

and fail in their intents. So, writing about, and analyzing the subject referred to the situation in Bosnia and Herzegovina, it tends to have an insight what can bring easement to managers and company, knowing a little more about something that is useful to be efficient and effective. Managers knowing what are the problems which can have during ERP implementation, and knowing what can affect their successful ERP implementation, they can prepare their action before initializing the first step of implementation, they can be ready to take the risks that can bring the using of the system, and successfully manage everything to get benefits from it.

Many researchers have brought their conclusion about which factors are affecting ERP implementation and which problems they have.

This paper is a combination of a literature review, that is an important part of the study considering the fact it provides us with solid theoretical background of this topic, and a scientific research done in three Bosnian company, which they differ in type of their business and organization.

They use different ERP systems, and they are very stable and successful in their work for a long term. It was analyzed what bring them to have a successful usage of their ERP systems, how they implement it and which difficulties they had during the implementation.

All collected information are obtained in different ways through a questionnaire identical for all respondents; one was an interview face to face, one was a correspondence by e-mails and, the last one, a deputy of the company attended to a presentation, organized by some students, where he explained the ERP implementation in their firm. Because of ethical issue in the paper the three companies' names will not be known, and they will be named each with a letter of alphabet "A", "B", and "C" company.

The study includes a few sections starting with this introduction, it provides a literature review, next section is about the research methodology. Then the results are presented, findings are discussed and finally recommendation, limitations and conclusions.

Literature reviw

An ERP software system is a complex information technology-based suite of programs or modules that allow an organization to collect, manage, and retrieve data from within nearly any part of the company. This set of modules integrates with the organizations sales, supply chain, customer relationships, and financials. The software essentially becomes integrated with the entire business operation and allows managers and leadership to access and review data that is vital to day-to-day decision making. Implementation of this software is one of the keys to determining overall success within the organization. (Mullins, 2013)

It facilitates a corporation to manage the efficient and effective use of resources (materials, human resources, finance, etc.) by providing a total integrated solution for the organization's information-processing requests, through a process-oriented view consistent across the company. (Shahin Dezdar, Ainin Sulaiman , 2009) The benefits associated with ERP systems are both tangible and intangible, and could be reflected in operational, managerial, strategic, infrastructural, and organizational dimension of a business.

When implemented successfully, ERP system can reduce cycle time, enable faster business transactions, facilitate better management, and enable e-commerce integration. However, the successful implementation of ERP systems has proven to be a difficult task. In one estimate, over half of ERP implementations are judge to be failures. (Neil A. Morton, Qing Hu, 2008)

It is a big investment that cost approximately, for a medium-sized company, according to the internet page of ERP Software Blog, in range between $175,000 to $ 750,000, including total software and service. (Kaupp, 2016)

Depending on different factors (financial, size of company, business nature etc.) companies decide to purchase the ERP software that match the best to them. Is possible to have information about the best, the popular or the most purchase software clicking on some internet sites, for example, according to ERP software 360 (Top 5 Client/Server ERP software Application, 2016) internet site, the five most popular ERP systems in 2016 are:

1. Epicor
2. Infor
3. Microsoft Dynamics
4. Oracle
5. SAP

The five best ERP system in 2016 according to the Capterra site (Top ERP software Products, 2016) are:

1. SAP ERP
2. M1
3. Passport Business Solution
4. VIENNA Advantage ERP/CRM
5. One Soft Connect

What is crucial for a successful ERP implementation are the critical success factors (CFSs) which affect it.

Joseph Bradly, in his research paper, selected ten critical success factors in ERP implementation based on tree criteria that dictate a successful implementation, that are: organizational improvement, on time and on budget; and divided in to three group: successful factors, factors that did not differentiate between success and failure and factors that are not required for the success of the projects. Observed successful factors are:

1. Project manager: Choosing the right full time project manager, with successful project management, business sand ERP experience behind can be central to project success. He don't need monetary or non-monetary rewards, but he just need a personal sense of accomplishment and recognition of performance.
2. Training: is regarded as important. Train stuff and spending resources on training result as a success factor.
3. Champion: is any individual who made a decisive contribution to the innovation by actively and enthusiastically promoting its progress through critical stages in order to obtain resources and/or active support from top management (Jose Manuel Esteves, Joan A. Pastor Collado, 2002); the use of a champion, in projects has a significant role in projects success.

Factors that did not differentiate between success and failure:

1. Consultants
2. Role of management in reducing user resistance
3. Steering committee

Factors that are not required for the success of the projects:

1. Integration of business planning and IT planning
2. Reporting level of project manager
3. Participation of the CEO or general manager (Bradley, 2008)

In literature is mention that there are many critical success factors that affect directly or indirectly the ERP implementations; according to Dezdar and Ainin (2009) in total 17 CSFs were identified, which is then categorized into five main categories.

1. Organization
2. ERP Project
3. ERP User
4. ERP Technology
5. External Expertise

No.	CSFs
1	Top management support and commitment
2	Project management and evaluation
3	Business process reengineering and minimum customization
4	ERP team composition, competence, and compensation
5	Change management programme
6	User training and education
7	Business plan and vision
8	Enterprise-wide communication and cooperation
9	Organizational culture
10	Vendor support
11	Software analysis, testing, and troubleshooting
12	Project champion
13	Careful selection of ERP software
14	Use of consultant
15	Appropriate business and IT legacy systems
16	System quality
17	User involvement

Table *1*: Critical Success Factors found in literature

Ke and Wei (2008) explain in their work that, leadership affects ERP implementation by fostering the desired organizational culture. Contend that ERP implementation success is positively related with organizational culture along the dimensions of learning and development, participative decision making, power sharing, support and collaboration, and tolerance for risk and conflicts. In addition, are identified the strategic and tactical actions that the top management can take to influence organizational culture and foster a cultural conducive to ERP implementation. ERP systems have strategic relevance because their integration into core business process or strategies can directly impact firms' performance. One study estimates that between 1.5% and 6% of firms' annual revenues are spent on ERP implementation. But only 10 to 15% survive and achieve expected performance improvement. The fit between the information system and organizational culture is critical for firms to reap potential benefits promised by the system. When the system conflicts with an organization's culture, resistance behavior will result: the system will be rejected, sabotaged or modified to match the existing culture. On the other hand, there are opinions that suggest that culture can be consciously designed and manipulated by leadership.

The two authors (Weiling Ke, Kwok Kee Wei, 2008)defined the relationships between the three terms are explained by prepositions.

ERP implementation and organization's culture:

1. ERP implementation success is positively related with the organization's learning and development culture.
2. ERP implementation success is positively related with the organization's participative decision-making culture.
3. ERP implementation success is positively related with the organization's power sharing culture.
4. ERP implementation success is positively related with the organization's collegial support and collaboration.
5. ERP implementation success is positively related with the organization's tolerance for conflicts and risk.

ERP and leadership:

1. Top management's transform vision of ERP is positively related to ERP implementation success.
2. Top management's transform vision of ERP adoption is positively related to an organizational culture of high tolerance for risk.
3. Top management's active advocacy of ERP adoption is positively related to a culture of learning and development, support and collaboration, and power sharing.
4. Top management's participation in the ERP learning session is positively related to a culture of participative decision making.
5. Top management's citizenship behavior is related to a culture of tolerance for conflicts.
6. Top management's power sharing behavior is positively related to a culture of power sharing.
7. Top management's sharing and inquisitive behavior is positively related to a culture that values knowledge sharing and learning.
8. Top management's setting up a learning structure is positively related to a culture of comprehensive and cross-functional communication.
9. Top management's dispensing appropriate contingent rewards is positively related to a culture of learning and development, risk taking, and support and collaboration.

In their paper they assume that there are some limitations. not supported by empirical data and tests, which are focusing just on the influence of the top management team and ignore peers' influence and social influence, followers' characteristics, which may interact with leadership 's influence on organizational culture in ERP adoption, national culture. (Weiling Ke, Kwok Kee Wei, 2008)

One other factor is the organization size that can be defined in two ways: by number of employees or by revenues. Companies of different sizes approach ERP implementations differently across a range of issues. Also, the benefits differ by company size. Larger companies report improvements in financial measures whereas smaller companies report better performance in manufacturing and logistics. (Vincent A. Mabert, Ashok Soni, M. A. Venkataramanan, 2003)

Companies of different sizes tended to do different things in their implementations. In particular, there were distinct differences between small and large companies over a range of issues. These differences included:

1. The motivation to go with an ERP system.
2. The different systems adopted.
3. The implementation strategies.
4. The degree of reengineering and customization of the base system. (2003)

One key difference is that companies of different sizes tend to do different things in their implementations across a range of issues this is mentioned in the article of V.Mabert et al. (2003),. For example, smaller companies are more likely to change their processes to fit the system whereas larger companies are more likely to customize the system. Any changes to the system can have major implications. Generally, modifications lead to higher costs, longer implementation time and more complicated implementations. Other differences across smaller and larger include the motivation to go with an ERP system, the implementation strategies, type of systems adopted, the extent of modifications to the base system, and the benefits the companies get from ERP. (Vincent A. Mabert, Ashok Soni, M. A. Venkataramanan, 2003)

Authors N. Morton and Q.Hu (2008) identify using structural contingency theory that, a critical determinant of an information system's success within an organization is the "fit" between the design of the system and the organization.

Accordingly, the internal structure of an ERP system is not necessarily aligned with the implementing organization's existing structure. However, because of the promising strategic and operational benefits that may occur after the implementation of an ERP system, an organization's top management is often tempted to adopt ERP without understanding the consequences of a potential misfit between the system and the organization.

"Contingency" is any variable that moderates the effect of an organizational characteristic on organizational performance, the contingency theory include efficiency, profitability, and worker satisfaction, size, environment, and technology.

Applying the structural contingency theory in the context of ERP implementation, it is possible to see that ERP systems possess characteristics that relate to the task uncertainty and task interdependence contingencies, as well as to the structural dimensions of formalization, structural differentiation and decentralization. Low-levels of business integration and relatively non-standardized work process will encounter high resistance in ERP implementation, like organization that use already a cross-functional structure. Political conflicts and IT projects result as critical success factors in ERP implementation too. The grater the change the system imposes, the grater the resistance; the less chance for implementation success. Organizations implementing ERP must consider the fit with their structure, the consequences of changing their business process, and the potential resistance from within. Such organizations must recognize that the implementation of ERP systems is likely to induce conflicts within their organizations and consequently impose difficulties and even result in failure in the implementation process if an initial misfit exists. Managers must be able to determine if a proposed ERP system is good fit with their organizational structure, or if it may only be a good fit with certain parts of the organization, or if significant customization and process redesigning or reengineering will be require. (Neil A. Morton, Qing Hu, 2008)

Livermore and Rippa (2011) collected the most influential factors in ERP implementation into two categories: Internal and External. Internal variables included (1) Organizational culture, (2) Leadership, (3) Communication, (4) Company size, and (5) Company history while external variables consists of (1) National culture, (2) Industry, (3) Economic conditions, and (4) Political conditions.

Maditinos et al. (2011), in their work, observed that consultancy service during the ERP implementation process is essential; knowledge transfer significantly influence ERP system success; knowledge transfer is more important than effective communication, and resolution among organizational members; top management support is found to be less important users support.

In low income countries, there may be various barriers such as bureaucracy, poor technology infrastructure, and lack of consultancy firms in order to plan, develop and implement an Enterprise Resource Planning project. (Özlen, 2012)

Özlen in his paper mentioned Dimitrijević and Rodić survey from 2011, with which explaned the difficult to have and therefore give information about the situation of SMEs in Bosnia and Herzegovina. They signified the problem of unarranged statistics on SME sector in Bosnia and Herzegovina. They also reported that data about SME sector cannot be achieved on EUROSTAT, OECD databases, European Innovation Scoreboard or other statistical databases. Furthermore, they stressed on the importance of Adjustment of statistical system for monitoring of SME sector and its performances for Bosnia and Herzegovina in order to define a better policy making for SMEs in general. MAPEER SME reports that there is also no specific data available for defined sectors of ICT and Environmental technologies.

The empirical findings in Özlen's research, showed that the BiH scene does not present a satisfactory result. There is a need for qualified staff to run ERP-like systems through BiH SMEs. Even the awareness of ERP is not reasonable. Additionally, it is observed that there is not enough number of organizations in BiH to conduct the survey. However, the majority of available companies resist filling out the survey. Furthermore, many organizations among the surveyed SMEs do not want to be in a further research and some of them do not want to get the results of the survey even they have completed the survey. On the other hand, there are some managers who are interested on ERP and other types of high technologies. (Özlen, 2012) „Despite, BiH high-technology enterprises feel the force of outside competitive environment in order to implement ERP; they don't feel political support. Hence, it is necessary for them to inform government about the issue or make strategic decisions in order to overcome this problem. Secondly, this study observed that the enterprises have motivated to implement ERP-like projects and feel the organizational strength to start the implementation. But, they cannot find proper consultation firms in order to adapt the projects to the organizations. Moreover, the surveyed organizations are aware of the possible advantages, disadvantages, difficulties and critical success factors of ERP implementation. Finally, the organizations seemed not to outsource ERP implementation but instead to develop in-house." (Özlen, 2012)

In this literature review it is visible that most of them are just theoretical expositions because of lack in empirical research. Second fact that is Critical Success Factors cannot be used just to see the success of an ERP implementation during and after the process but they can be used just before the decision to implement an ERP system in an organization. An organization can make an analysis of internal and external threats and opportunities regarding this factors, using the findings and frameworks presented

in the study like a guide (Bradley, 2008). And because of this fact the only problem, that can be, about ERP implementation, is the differences between organizations in different countries, like it said Asian organization differs from North American and European organizations, that means some critical success factors may differ from country to country and this means new research about critical success factors in different country can be made.

Research methodology and objectives

For this survey it was decided to conduct a primary research and focus on gathering enough information from three respondents. The chosen respondents are three Bosnian company, which they differ in type of their business and organization. They use different ERP systems, and they are very stable and successful in their work for a long term.

Since qualitative research proposes use of hypotheses - generating rather than hypotheses - testing research, it was able to start the research study without having to test these hypotheses and to develop them by listening what our respondents have said.

The main objective in the research is to find out which factors affect ERP implementation in Bosnian companies and, to find this is necessary ask some main questions, that are:

1. "What bring them to purchase an ERP system?"
2. "Which difficulties they had during implementation?"
3. "What bring them to have a successful usage of their ERP system?"

All collected information are obtained in different ways of answering to an identical questionnaire of 30 questions for all respondents; one was an interview face to face, one was a correspondence by e-mails and, the last one, a deputy of the company attended to a presentation, organized by some students, where he explained the ERP implementation in their firm.

Because of ethical issue in the paper the three companies' names will not be known, and they will be named each with a letter of alphabet "A", "B", and "C" company.

The companies, how it is mentioned before, are stable and successful company, they were chosen because of their success in manage and implement an ERP system. And hopefully the findings of this research could help other companies with difficulties in implementing ERP systems in their own.

The reason why ware chosen three different types of companies, with different organizational culture, is because it was necessary to show how a totally domestic big private company differ from a public company and this two differ from a big multinational private company that operates on almost entire Balkans. One more reason is because it is necessary to show that there are successful company that work hard to be first in what they are doing, and to show that "not everything is black as it is thoughts".

Results

Company "A" - The totally domestic big private company - It has around 3000 employees, begin with a small retail and wholesale company that begin his "first step to be big" with acquisitioning another company, and acquisition remain their strategy to conquest market share through years.

Management, after some conflicts about adopting the idea of an ERP system, finally decide to change their existing IT solution for controlling the activities in their company, that become increasingly bigger through years, with Microsoft Dynamics Nav ERP system that is used as a roll out for all the acquired firms-.

They purchase it for about 200.000,00 KM, the decision was a strategic action taken because of financial and organizational aspects. The IT solution that they had before was a good option in the beginning but later became heft and, errors just became too expensive.

The ERP system has almost every function, except the logistic and warehouse because of physical problems.

The problems that they had during the implementation was adaptation to the new ERP system and customization, integration of every department, data cleansing from the seminal system that they had, work on current activities during the preparation phase, unregulated activities process, unrealistic expectations.

Positive aspects of the ERP implementation are: organization as a whole, elimination of dabble data, supports the integrated growth of the company and all its parts, indirect benefits to customers, decreasing costs and time.

Because of the total support, during the implementation process, from the owner of the company and from the top management, which have a good knowledge about ERP systems, they could successfully implement Microsoft Dynamics Nav.

Company "B" – The public company – Is a medium size enterprise, financed with state budget mostly.

In 2004 after the committee chose between three ERP offers, they begin to use, for financial purpose, one ERP system named "Times" that a Croatian firm custom made for them and, which they purchase for about 25.000,00 KM, in that time was the cheapest offer that they had. In 2010 after the same process of choosing between three ERP systems, they purchase another system named "Burial", the same custom made from a domestic company, this one was just for customer relationships.

They didn't had too much problems with the system "Times", just little problems during inserting some data, but not relevant because they could manage it, and they had problem with server because many times shut down.

They had problem with "Burial" because of the data of the customers, factors like changes in demography, migration of the population during and after the war in Bosnia and Hercegovina, natural selection of the payers and handwrite database had a big effect on the implementation. They have problems with technical support, because first full the company that made them the system, closed down and a person which worked on the implementation project, give them technical support but is not

in the country anymore, the company have to pay very high prices for servicing the ERP system.

The positive affect of the ERP system implementation are: promptness, good records and relief for the customer.

A good company organization, a good data base and the software itself are the success factors that affect a successful ERP implementation in this company.

Company "C" - big multinational private company that operates on almost entire Balkans – The number of employees of the company in Bosnia and Hercegovina is unknown, because the collected answers were given from an employee from Belgrade that work especially on the implementation of the ERP system in the company that use the roll-out method of implementation through all the companies in Bosnia and Herzegovina and in other Balkans countries.

In this company they use SAP ERP system ECC 6.0, the person which give the answers didn't know the exactly price of the system, but he can tell that is a big investment.

The decision of implementing this ERP system was a strategic decision in front of entire business group. On the proposal of the IT sector, company management has decided to implement a serious ERP solution to enable fast and efficient development of the business system to accompany the dynamic growth of the companies within the group. They implement in all spheres of the business.

In the case of rollout are avoided the classic problems of development functionality, so they challenge the implementation of any adjustment structure and „purity „of data from the old system to the new SAP structure. They just had some difficulties with CRM that includes user's data (mother data, services, equipment ...) that it had to be adapted to the new needs of the SAP system. The solution speeds up the application of information tools

The positive thing about SAP ERP system is that delivers the automation of business processes, their control and feedback, ensures the integrity of the business system, which ensures that the data for export from any part of the business system is immediately and unconditionally available to authorized users of other parts of the business system. A particular benefit of implementation of the SAP ERP system is the safety and security of data for export business system.

The decision and the support of the management in project implementation, the "young" employee structure that has no resistance to information technology and the support staff from companies that are already using the SAP solution are the success factors that affect an excellent ERP implementation in the company.

Discussion

Looking at the literature review and comparing the theoretical findings with the research's findings, is possible to conclude that:

The similarities in all three case are that management had a very important part in successfully implement the chosen ERP systems, giving support in all phases of the implementation and in bringing good decisions. Than the problem which the three company had, was the problem with the data cleansing.

Is possible to see that being a public or private company does not interfere a lot in having a successful implementation, it just decide which ERP system a company can afford because of budget restriction that the state can give.

Another fact is that a custom made ERP system that is sell from a small company can work efficiently like the ones from a famous company like SAP, maybe the only difference in using a custom made system than a standard one is in the organization size and the problem with the technical support.

It is obvious that, depending of the nature of the business, internal and external factors can affect the implementation.

It can be said that the problem for company "A" were mostly organizational because of their business strategy of acquiring other companies.

For company "B" were financial problem because, of the budget restriction. We find sociodemographic problems, but this type are just referred to the nature of the business.

In the "C" company is possible to comment that maybe because of the roll-out methodology of implementation they don't have strategical, organizational neither cultural problem, just technical about data cleansing.

In the result part is not mentioned that all three company during implementation had training periods where the final users are educated and trained to use ERP systems in the best way. It is important that education and implementation trainings are regularly held especially when new innovation for the systems are offered to increase the functionality and efficiency of the system that make the company effective and efficient too.

All three company comment that ERP system is just a tool, and is just to help employees to be efficient and effective.

Conclusion

This study provide just a small piece of new finding about successful ERP system implementation referred to the Bosnian market. How it said in the introduction part is a unexplored field in Bosnia and Herzegovina. More research have to be done to have a clearly picture of the situation in this country. In this work are used just three success companies, but is just a small generalization that has been done to find out what affect ERP implementation.

More education has to be given to the students, entrepreneurs, investors and companies as well and to accomplish this is necessary to have more information. This is possible to figure out if the country's policy join and allow the analysis and researches, because without a clear picture of the situation in the country and without adequate data, investors will bypass this region that has a lot of opportunities.

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