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CONTENTS

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HYPOTHESIS (ES)

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

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CRITICAL SUCCESS FACTORS IN ERP IMPLEMENTATION: A REVIEW

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ABSTRACT
ERP systems have become vital strategic tools in today's competitive business environment. This work presents a review of recent researches on ERP systems. It attempts to identify the main benefits of ERP systems, the drawbacks and the critical success factors for implementation discussed in the relevant literature. The findings revealed that despite some organizations have faced challenges undertaking ERP implementations, many others have enjoyed the benefits that the systems have brought to the organizations. ERP system facilitates the smooth flow of common functional information and practices across the entire organization. In addition, it improves the performance of the supply chain and reduces the cycle times. However, without top management support, an appropriate business plan, farsighted vision, re-engineering business process, effective project management, user involvement, relevant education and rigorous training, organizations cannot embrace full benefits of such complex system and the risk of failure is deemed to be at high level.

KEYWORDS
ERP, benefits, drawbacks, success factors.

1. INTRODUCTION
Understanding the critical success factors in implementing Enterprise Resource Planning (ERP) systems has been a challenging process for many organizations worldwide. An ERP system enables an organization to integrate all the primary business process in order to enhance efficiency and maintain a competitive position. However, without successful implementation of the system, the projected benefits of improved productivity and competitive advantage would not be forthcoming.

In its basic definition, ERP is an enterprise-wide information system that integrates and controls all the business processes in the entire organization. According to Nah and Lau (2001) ERP is "a packaged business software system that enables a company 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 needs". This software if well implemented facilitates the integration of all the functional information flows across the organization into a single package with a common database. Therefore, it allows easy and immediate access to information regarding inventory, product or customer data and prior history information (Shehab *et al.*, 2004).

ERP initially covered all routine transactions within an organization only. However, it was later expanded to cover external customers and suppliers (Turban *et al.*, 2006). Nah and Lau (2001) stated that most ERP systems now have the functionality and the capability to facilitate the flow of information across all business processes internally and externally as well. Furthermore, ERP systems have the capability to "reach beyond their own corporate walls to better connect with suppliers, distributors and customers to engage in e-business".

Today, many public and private organizations worldwide are implementing ERP systems in place of the functional legacy systems (which may be referred with respect to their age, void support from vendors or out dated technology etc.) that are not anymore well -compatible with modern business environment. However, according to Kroenke (2008), the process of moving from functional applications to an ERP system is difficult and challenging. Additionally, the switch to ERP system is expensive and it requires development of new procedures, training and converting data (Zhang *et al.*, 2005).

2. RESEARCH AIM
Many ERP research studies have determined several critical success factors in ERP implementations (see table 1). These studies, however, discussed the success factors from different prospective and in different contexts.
The coupled aims of this study are:
a) To identify the most cited ERP critical success factors in the literature.
b) To arrange these scattered factors in an organized and adequate set in order to have a better understanding and a clearer picture of the factors that are considered to be vital for a successful ERP implementation.

3. METHODOLOGY
This study is a review of literature on ERP. We decided to focus our study on articles that discuss the ERP implementation and particularly the critical success factors. All the articles that were selected are published in peer-reviewed and prestigious journals. There are two up-to-date books used in this study. All the articled surveyed were extracted from different business and information systems databases such as ABI Inform, Emerald, ScienceDirect and ACM Digital Library. The terms *ERP*, *Enterprise Resource Planning*, *ERP success factors have been used*. We limited the search date to be between (2000 and 20014) in order to get relatively new articles. To better analyze the articles, we divided them into three categories based on the main topic they discussed. The three categories are: ERP overview, ERP benefits and drawbacks, ERP success factors.

4. FINDINGS

The next three sub-sections discuss the main findings revealed from the reviewed articles. Firstly, the benefits of ERP are presented. Then, the challenges of ERP implementation are identified. The third section outlines and discusses the key factors that contribute to ERP success.

4.1   BENEFITS OF ERP

Several research studies have identified various important benefits the ERP systems bring to organizations. O'Leary (2000) stated that an ERP system integrates the majority of the business processes and allows access to the data in real time. Furthermore, ERP improves the performance level of a supply chain by helping to reduce cycle times (Gardiner et al., 2002). There are also some intangible benefits that an organization may enjoy by implementing an ERP system including, better customer satisfaction, improved vendor performance, increased flexibility, reduced quality costs, improved resource utility, improved information accuracy and improved decision-making capability (Siriginidi, 2000).

The IT based projects already implemented have clearly provided the organization with a short-term profit as well as continuous flow of earnings from service fees. Hana Klčová et al. (2009) mentioned such projects with a view of long-term benefits, permanent custom and satisfaction of clients and increase of positive references can be inferred.

Implementation of ERP in SIKO Koupelny, the largest dealers of bathroom fittings in the Czech Republic is emphasized by Petr Sodomka et al. (2014). The cumulative approach has mark ably enhanced the organization, by creating and controlling the documentation for changing system and empowering the control system based on the reports of the MIS.

Hong, Kyung-Kwon et al. (2002) mentioned in their work that according to IT managers who are responsible for management of Enterprise Resource Planning implementation, the ERP systems are most strategic computation platform.

4.2   DRAWBACKS OF ERP

Despite the potential benefits discussed above, however, ERP systems also have a number of drawbacks. For example, most ERP systems tend to be large, complicated, and expensive (Mabert et al., 2001). Moreover, ERP implementation requires an enormous time commitment from an organization's information technology department or outside professionals. In addition, because ERP systems affected most major departments in a company, they tended to create changes in many business processes. According to Shang and Seddon (2002) putting ERP in place requires new procedures, employee training, and both managerial and technical support.

Ali H. Al-Badi et al. (2010) states that although technology helps the use of new technologies, but projects technically more complex platform, the point is debated crisply for layer based components. It further impress that even making applications to access varying databases also needs detailed knowhow.

4.3   CRITICAL SUCCESS FACTORS IN ERP IMPLEMENTATION

Table 1 presents the main factors revealed from the literature review and that are found to be vital for successful ERP implementation:

TABLE 1: CRITICAL SUCCESS FACTORS IN ERP IMPLEMENTATION

CRITICAL SUCCESS FACTOR	REFERENCES
Top management support	Al-Mashari *et al.* (2003); Umble *et al.*(2003); Zhang *et al.* (2002)
Business plan and vision	Loh *et al.* (2004); Schwalbe, (2000); Somers and Nelson (2004); Nah *et al.* (2003)
Re-engineering business process	Davison (2002); Hammer and Champy (2001); Somers and Nelson (2004); Nah (2003); Murray and Coffin (2001)
Effective project management and project champion	Zhang *et al.,(* 2002); Somers and Nelson (2004); Remus (2006); Loh *et al.* (2004);
Teamwork and composition	Loh *et al.* (2004); Al-Mashari *et al.*, (2006); Remus (2006); Nah *et al.* (2003); Rosario (2000)
ERP system selection	Wei and Wang (2004); Shehab *et al.,* (2004); Everdingen *et al.* (2000); Sprott (2000)
User involvement	Esteves *et al.*, (2003); Zhang el at (2002)
Education and training	(Woo 2007); Nah *et al.*, (2003); Zhang *et al.* (2002)
Economics	Sodomka *et al.* (2009).

4.3.1   Top Management Support

Top management support has been identified as the most important success factor in ERP system implementation projects. According to Zhang et al. (2002) top management support in ERP, implementation has two main aspects: providing leadership and providing the necessary resources. Additionally, the roles of top management in ERP implementation comprise developing an understanding of the capabilities and limitations, establishing reasonable objectives for ERP system, exhibiting commitment, and communicating the corporate strategy to all employees (Umble et al., 2003).

Al-Mashari et al. (2003) argued that top management support does not end with initiation and facilitation, but must extend to the full implementation of an ERP system. Furthermore, top management support should provide direction to the implementation teams and monitor the progress of the project.

4.3.2   Business Plan and Vision

A clear business plan and vision is needed to guide the project throughout the ERP life cycle (Loh et al., 2004). Project management identifies three competing and interrelated goals namely; scope, time, and cost goals (Schwalbe, 2000).The primary stage of any project should begin with a conceptualization of the goals and possible ways to achieve these goals. Additionally, goals should be explained so they are specific and operational, and to indicate the general directions of the project (Somers and Nelson 2004).

Nah (2003) stated that one of the biggest problems ERP project leaders face comes not from the implementation itself, but from expectations of board members, senior staff, and other key stakeholders. It is important to set the goals of the project before even seeking top management support. Many ERP implementations have failed as a result of lacking clear plans (Somers and Nelson 2004).

4.3.3   Re-engineering Business Process

Petr Sodomka et al. (2010) scribes that in-house accounting system, are not sufficiently worked upon currently, which is offended with respect to financial accounting principles. This scenario will definitely lead to non-precise and scarce information for the management of the entire organization.

Ali H. Al-Badi et al. (2010) emphasizes that the data is the foremost requirement of the organisation's business application and the technical capability to integrate various data to enable software applications to function and reach expected target.

Hammer and Champy (2009) defined Business process re-engineering (BPR) as "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed". Somers and Nelson (2004) stated that BPR plays a significant role in the early stages of implementation. Furthermore, it is important in the acceptance stage and tends to be less important when the technology becomes routine.

Nah (2003) noted that reengineering should continue with new ideas and updates to take full advantage of the ERP system when the system is in use. Organizations should be willing to change their businesses to fit the software in order to reduce the degree of customizations (Murray and Coffin, 2001). Many organizations have made unnecessary, complex customizations to ERP software because the people making the changes do not fully understand the organization's business practices (Nah 2003). According to Somers and Nelson (2004) the new business model and reengineering that drives technology choice is an enabling factor that can give to ERP success. Furthermore, Davison (2002) argued that ERP implementation often requires changes in job descriptions and essential skills.

4.3.4   Project Management and Project Champion

ERP systems implementation is a set of complex activities thus, organizations should have an effective project management strategy to control the implementation process (Zhang et al., 2002). Project management activities span from the first stage of the ERP life cycle to closing it. Project planning and control is a function of the project's characteristics such as project size, experiences with the technology, and project structure (Somers and Nelson, 2004).

Remus (2006) noted that project champion is one of the most important factors in the implementation of ERP systems. Project champions should own the role of change champion for the life of the project and understand the technology as well as the business and organizational context. Furthermore, project champion must attempt to manage resistance towards positive change in the old system (Loh and Koh, 2004).

4.3.5   Teamwork and Composition
The ERP team should involve of the best people in the organization (Loh and Koh 2004). Al-Mashari et al., (2006) the success of projects is related to the knowledge, skills, abilities, and experiences of the project manager as well as the selection of the right team members. Also, team should not only be technologically competent but also understand the company and its business requirements (Remus 2006).

An ERP project involves all of the functional departments in an enterprise. It demands the effort and cooperation of technical and business experts as well as end-users (Loh and Koh 2004). Both business experts and technical knowledge are important for success (Nah 2003). The sharing of information between the implementation partners is essential and requires partnership trust (Loh and Koh 2004). Moreover, the team should be familiar with the business functions and products so that they know what needs to be improved to the current system (Rosario 2000).

4.3.6   ERP System Selection
The selection of a suitable ERP system is a challenging and time- consuming process. Zainal Arifin Hasibuan et al. (2012) states, that many organizations implement the ERP system just to encompass the technology driven era, rather than business needs. Such shifts probably lead to wrong selection. Therefore, it is the immense need for the company to select the appropriate product that supports its operational process.

Wei and Wang (2004) stated that there is no one single ERP package that could provide all the functionalities required for the business. There are various ERP packages in the market with similar functionality but different designs including, SAP, Oracle, JD Edwards and Baan (Shehab et al., 2004). Therefore, an organization must select an appropriate vendor that able to provide a flexible ERP system. Various authors identified important criteria that need to be taken into account when selecting a new ERP system. For example, a study by Everdingen et al. (2000) stressed that the ERP system selected has to closely fit with most of the current business procedures. Additionally, the system has to be flexible, user-friendly and easy to implement. Another similar research study by Sprott (2000) reported that applicability, integration, adaptability and upgradeability are essential factors that have to be considered in ERP adoption.

4.3.7   User Involvement
User involvement is one of the most cited critical success factors in ERP implementation projects. User involvement increase user satisfaction and acceptance by developing realistic expectations about system capabilities (Esteves et al., 2003). User involvement is essential because it improves perceived control through participating the whole project plan. According to Zhang el at (2002) there are two areas for user involvement when the company decides to implement an ERP system: user involvement in the stage of definition of the organization's ERP system needs, and user participates in the implementation of ERP systems.

4.3.8   Education and Training
Educating and training users to use ERP is important because ERP is not easy to use even with good IT skills (Woo 2007). Nah et al., (2003) argued that sufficient training can assist increase success for ERP systems. However, lack of training may lead to failure. According to Zhang et al. (2002) the main reason for education and training is to increase the expertise and knowledge level of the users within the company.

5. LIMITATIONS OF THE RESEARCH
At present, we do not claim that a comprehensive review has been conducted to identify the benefits, the drawbacks and the main critical factors for ERP implementation. Implementation of ERP has not been studied industry-wise so probably implementation in certain type of industry would be easier compared to other(s). Study does not take into account the size of the organization while discussing implementation of ERP. CSF may vary depending on the size of the company. However, despite the need for more rigorous analytical methods, this study helped us at this stage to evaluate the related ERP literature and gain theoretical background on the subject, which shall prepare us for a large-scale empirical study in the future.

6. CONCLUSION
To adapt to today's challenging and competitive business environment, organizations are implementing ERP systems to achieve a capability to plan and integrate enterprise-wide resources in order to shorten lead times, and to be more responsive to customer demands.

This paper attempts to review the ERP literature and identify the benefits, drawbacks and the critical success factor in ERP implementation. While this paper does not produce generalizable results, it provides insights for IS practitioners who may consider implementing ERP in their organizations. The paper identifies the most cited success factors in the literature and illustrates their significant importance in ERP implementation.

Most of the articles stressed that each organization must assess itself, to see if it is ready for ERP. Many organizations that attempt to implement ERP systems run into difficulty because such organizations may not be ready for integration and the various departments within it have their own agendas and objectives that conflict with each other.

Despite the fact that ERP integrates and optimizes the flow of information across the entire organization's supply chain, the implementation of such software packages can be costly, and may even require reengineering the entire business operations. Combinations of factors have to be considered when undertaking an ERP implementation including: top management support, business plan and vision, Re-engineering business process, effective project management and project champion, careful package selection process, teamwork and composition, user involvement and education and training.

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