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An Exploration of Critical Success Factors for Enterprise Resource Planning System Implementation

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Abstract:

Enterprise resource planning System (ERPS) is a standout amongst the most complicated frame-works in data framework field. Its usage is exorbitant and more confounded. Also, vast numbers of ERPS usage have been unsuccessful. Hence, the critical success factors (CSFs) of ERPS execution still are among the most critical research zone throughout the years with a specific end goal to conquer the issue of fizzled ERPS usage. Consequently, this paper summarizes the earlier efforts to collect these CSFs and evaluating them through a literature review. Our work proposed to move back to the first meaning of CSFs of ERPS execution with a specific end goal to locate the common factors that have similar importance and after that, maintaining a strategic distance from the issue of making a perplex of them. What is more is that this paper proposes an examination zone to explain those CSFs profoundly by considering numerous factors like tracking CSFs of ERPS execution over the time, technology evolution, and qualities of the nations.

Keywords: Critical Success Factors, ERP, CSFs, ERP implementation, Enterprise Resource Planning (ERP) System, Information System, IS

1. Introduction

In the past years, it has been an expanding enthusiasm for ERPS as a reason for broadening the chances of any organization (Ndede-Amadi, 2004)(Sharif & Irani, 2005). It empowers the sharing of data between firms in a pro proficient route and besides, allows the administration access to any partner by utilizing venture entryway. A reasonable structure for ERPS made of four segments which are(Møller, 2005); business to business, business to client, business to worker, and enterprise application integration.

ERPS has been characterized as the idea that incorporates hardware, software, services, personnel, and firms that help communitarian network exercises(Carter & Green, 2009). One of the fundamental purposes for utilizing ERPS is to accomplish the joining of the frameworks over various areas, to be sure, there is a positive (coordinate) connection between utilizing the ERPS to fulfill the clients and accomplishing commercial profit(Tsamantanis & Kogetsidis, 2006).

In 2013, the market of ERPS developed by 3.8%(Norton, 2015), numerous organizations had effectively executed ERPS(Yen, Chou, & Chang, 2002)(Scott & Vessey, 2002), as the following rates; more than 60% of smaller organizations, 39% of substantial organizations, and 70% all of Fortune 1000 organizations. 90% of ERPS implementation have been running past their planned date(Scott & Vessey, 2002), and just 35% of ERPS executions have been done on time and inside spending plan(Dong, Neufeld, & Higgins, 2009).

ERPS usage contrast from the executions of conventional frameworks in term of scale, scope, intricacy, enterprise changes through the advancement of CSFs in ERPS, which is still changed over the time and the innovation. Execution of ERPS contains numerous risks, where all things have considered, for example, 65% of managers opinion believed that ERPS has a negative impact on the organizations; in term of the usage issues(Cliffe, Champion, Landry, & Roche, 1998). Hence, it is critical to ponder all the CSFs of executing ERPS, as numerous analysts have characterized numerous variables would be fundamental to the succession of ERPS implementation.

Based on that, this study intended to review, evaluate, and determine the CSFs of ERPS that contribute to the success of ERPS implementation through the literature reviews. The current paper is organized as follows; section 2 discusses the concept of ERPS as initially conceptualized in the literature. Next, section 3 has provided an overview of the success and failure of ERPS implementation. Then, section 4 gives an idea about CSFs approach in the field of ERPS implementation. After that, section 5 is concerned with the methodology used for this study. Section 6 gives a list of the CSF of ERP implementation based on the literature reviews from 2000 to 2015 through using content analysis and then discusses the essential CSFs in more details. Section 7 summarizes and discusses the findings. Finally, section 8 concludes this paper and highlights possible future work.

2. Donations of ERP

The legacy systems have been utilized to fulfill the necessities of an office over the firm, yet they cannot incorporate them together. Subsequently, the data has typically handled commonly many times over various offices which prompt the issue when decision makers urge to take a choice between alternatives based on an accessible data progressively. They would not be able to know which office has contained a constant data. Accordingly, the Gartner group has started the ERPS with a specific end goal to defeat the constant data (Muhleman, Kim, Canton, Homan, & Breese-vitelli, 2012).

ERPS has been explained by numerous researchers, for example, (Minahan, 1998) has indicated that it characterized as a product of computerized framework, it considered the essential procedures of an organization. While (Kumar & van Hillegerberg, 2000) characterized it as bundles of data frameworks that incorporate both data and data-based procedures crosswise over numerous offices in the organization. (Nah, F., J., & Kuang, 2001) observed that it a bundled programming framework that utilized as a part of a request to deal with the utilization of assets in a proficient and successful route through giving the coordinated answer for the solicitations of data preparing based a procedure arranged view steady over the organization. From the previous definitions of ERPS, the definition has changed over the time as a result of changing the systems to include the activities of front and back-office such as supply chain management and customer relationship management, and therefore there is a degree of disagreed around the meaning of ERPS. In this paper, all the previous definitions will be adapted to describe ERPS.

3. ERP Implementation Success

The implementation of ERPS is considered one of the widespread phenomena in the business world. However, the percentage of failed implementation of it is yet high (Saeed et al., 2017), as some of the literature reviews (Saeed et al., 2017) (Esteves & Pastor-Collado, 2000) indicate that the success or failure of ERPS is not conclusive evidence. Where other groups of researchers (Saxena & Mcdonagh, 2017) have pointed out the positive impact of implementing ERPS, one of the main causes behind those deferent points of views is the multidimensionality of the term success, thus it is difficult to develop a single measurement of success and failure.

On the off chance that there are upfront objectives for the execution of ERPS, the advantages will be assessed against the accomplishment of those objectives. Then again, if there are no obey, the ERPS will not help the firm to accomplish the desired outcomes, and then the advantage is not resolved. Along these lines, the achievement and failures of ERPS rely upon firms' objectives and advantages.

4. CSFs of ERPS Implementation

The term of success depends on researcher perspective. It can differ from person to another. It is evident that when the people are talking about the success of the information system and ERPS, they mean different things (Markus, Tanis, & van Fenema, 2000) (Esteves & Pastor-Collado, 2000). The approach of CSFs was used firstly by Rockhart (John F. Rockart, 1979) in the field of the information system. The ERP implementations requirement is to understand and address CSFs set that must be met to make the implementation process successfully (Joseph, 2008). The managerial or enterprise areas should give attention to increasing the organization performance and success. The CSFs of ERPS is one of the essential topics that most researched in ERP research such as in (Nah et al., 2001) (Ang, Sum, & Chung, 1995) (Jr & C., 2001) (Gefen, 2004) (Ifinedo & Nahar, 2016). This study attempts to identify and discover the CSFs for a successful ERPS implementation, and each CSF is described with literature reviews that support its impact on ERPS implementations.

5. Methodology

Research methodology is one of the most critical segments in any research, as it guides the researchers towards the steps that followed to achieve the objectives of specific research. Here, the aim of this research was to identify all the CSFs that lead to the success of ERPS implementation. The content analysis has been used to create a summary of CSFs that published in previous researches between 2000-2015. The current review was limited to a list of 10 keywords that used to describe CSFs of ERPS implementation and is based mainly on Google Scholar and Scopus engines. The lists of search keywords are listed below:

- Enterprise resource planning
- Enterprise resource planning system
- Information system
- Critical success factors
- Critical factors
- ERP
- ERPS
- Critical success factors 'AND' ERP
- Critical success factors 'AND' Enterprise resource planning
- ERP 'AND' Implementation

6. CSFs of ERPS Implementation

CSFs have an important role in building ERPS. As mentioned in section 4, they can help the organizations to implement ERPS successfully. From the previous literature, were published in the specified period, we found 37 CSFs of ERPS implementation. Those factors have presented in Table 1.

Risk Management	Change Management	Performance Management
business process reengineering	Organizational Culture	Testing and Troubleshooting
Top Management Support	Project Team	Customization
Business Plan and Vision	Data Related Aspects	Project Management
Interdepartmental Dynamics	User Education and Training	Implementation Strategy
Communication	Project Scope	Project Champion
Process Fit and Alignment	user engagement	Empowered Decision Makers
Package Selection	Financial Management	Legacy System
Managing Expectations	Partner Relationship	Project Planning
Consultants	Technical Complexity	National Culture
IT Infrastructure and Resources	IT Skills and Experience	Configuration
Localization Requirements	Industry Environment	Organization Size
Knowledge Management		

Table 1: CSFS for ERPS Implementation

However, if all those CSFs of ERPS are identified in isolation from others, this solution will lead to creating a puzzle. The next section, therefore, moves on to give more and structured details about only some CSFs which presented in table1, as the other CSFs had the same meaning with different terms.

7. The Important CSFs of ERPS Implementation

7.1. Change Management

The structure of the enterprise found that most of the enterprises are not reasonable with the structure of ERPS. Analysis highlight that the preparation and correspondence are essential strategies for fruitful change management. In the examinations which set out to decide the preparation techniques, (Noudoostbeni, Yasin, & Jenatabadi, 2009) demonstrated that the activity preparing, PC based preparing, and group preparing are the best strategies for preparing and proposed to consolidate them to accomplish the effective change administration. In another investigation, (Koh, Gunasekaran, & Cooper, 2009) found that test database, preparing CDs, programming discharge notes, and Helping the client by phone is the most electric apparatuses in the field of preparing. Additionally, the investigation of (Sykes, 2015) demonstrated that the customary preparing, online help, and enable work area to help are the most critical indicators of preparing results. Then, (Karuppan & Karuppan, 2008) found that the execution of representatives diminished when the time passed increment between the preparation and framework take off.

To use the communication in a practical way for change management, (Huq, Huq, & Cutright, 2006) proposed using many channels of communication, interactive media, as well as continuous communication. The type of communication channels also depends on stakeholders. According to (Finney, 2011), face to face communication is a better method than emails in training. The timing also plays an essential role in the communication. For example, (Huq et al., 2006) indicated that the plans of communication must give the employees enough time to let them use the new systems or processes as they need a long time to understand the change and to adjust to it.

7.2. Business Process Re-engineering

One of the main problems related to implementing ERPS is the incompatibility between the features of ERPS and the business processes of the organizations (Janson & Subramanian, 1996). To avoid this problem and gain the benefits of ERPS implementation, the organizations should align its business processes with ERPS. The literature of re-engineering (Hammer & Champy, 1994) and ERPS proposed that ERPS cannot enhance the performance of organizations except if their business processes restructured (Bingi, Sharma, & Godla, 1999). The study by (Willcocks & Sykes, 2000) showed that the new business model and the redesign of business processes contribute to implement ERPS successfully, since they lead to the highest return on investment, but also they can increase the level of costs, risks, and complexity (Kirchmer, 1998).

7.3. Top Management Support

Top management bolster has been referred to as a standout amongst the most CSFs for ERPS usage. (Sarker & Lee, 2003) found that best administration bolster is a vital factor in the achievement of ERPS. Likewise, (Dezdar & Ainin, 2011) found that best administration bolster has substantial ramifications than the client preparing and undertaking extensive correspondence. Likewise, (Young & Jordan, 2008) demonstrated that best administration bolster strongly affects the accomplishment of the venture when contrasted with venture administration. On the other hand, (Ifinedo, 2008) showed that best administration bolster and the accomplishment of ERPS have a direct help relationship.

Then again, (Martin & Huq, 2007) detailed that if the exertion of best administration bolsters for the most part centers around social and relevant variables, the open door for the accomplishment of ERPS execution will increment. The creators have assembled the exercises of best administration bolster into three classes which are; asset provisioning, change administration, and sharing the vision (Dong et al., 2009). The principal class influences the culmination of the task, the second classification impacts the mentality and abilities of the clients, and the third one enables a supervisor to purchase.

7.4 Business Plan and Vision

It were one of the CSFs of ERPS implementation (Ang et al., 1995). Any project should start by sitting the goals and the reasonable ways to achieve those goals (D. Slevin & Pinto, 1998). The goals should be more specific and show the direction and progress of the project (Cleland & King, 1988). In a study conducted by (D. P. Slevin & Pinto, 1986), it was indicated that goals need to be meet three constraints which are; scope, time, and cost goals (Schwalbe, 2011). Unless the clear plan were sitting up-to-front, the ERPS would suffer from scope creep (Sweat, 1999).

7.5. Project Management

The significance of Project management in IT field is archived well. The Project management beginning from the starting of the undertaking till completing it (Somers & Nelson, 2001). The article of (Jr & C., 2001) was the principal article that talks about ERPS execution in term of Project management. It demonstrated the distinctive exercises of Project management amid the periods of ERPS venture and stressed that utilizing venture administration is a critical factor for ERPS achievement.

Sammon and Adam brought up that individuals from the undertaking group ought to have enough learning in the field of specialized and task space (Sammon & Adam, 2010). So also, in the investigation of (Rothenberger, Srite, & Jones-Graham, 2010), the authors showed that group which comprises of multi-talented individuals is critical for the achievement of ERPS venture. Then again, (Gefen & Ridings, 2002) have demonstrated that undertaking group responsiveness to the clients and social trade amid the life of the venture decidedly influence the ERPS execution achievement. In term of project scope, the study of (Santamaría-Sánchez, Núñez-Nickel, & Gago-Rodríguez, 2010) indicated that modules-based business support takes less time than modules based value chain as a result of complex inter-dependencies in modules based value chain. Also, it confirmed that size and complexity of implementation would negatively impact the outcomes of the project.

7.6. Knowledge Management

The issue of knowledge management in ERPS venture happens at the level of changing the learning to customers from experts, learning administration in the group of execution, and trans-shaping learning from the group of usage to end clients. All the requires more consideration towards redistributing the duties and besides another structure of learning in the associations (Lee & Lee, 2000).

(Haines & Goodhue, 2003) have shown that changing the learning from the advisers to the interior specialists is one of the key CSFs for the achievement of ERPS usage. While the investigation of (Hung, Ho, Jou, & Kung, 2012), have demonstrated that best administration bolster and the inside impetuses can affect emphatically on information changing from the advisers to the customer by making a decent learning exchange atmosphere, and additionally the experience and capacities of experts assume a critical part in exchanging the information to customers. On the other hand, the study of (Volkoff, Elmes, & Strong, 2004) indicated that power-users, which is a type of train the trainer (Haines & Goodhue, 2003), is one of the essential techniques that facilitate the transforming of knowledge from ERPS implementation to end users.

7.7. Partner Relationship

Literature regarding the partner relationship has pointed out the role that both trust and quality of interactions have a play, in the stage of implementation. For Example, the study of (Gefen, 2004) showed that trust in the partner increases the assessment of the clients for the business relationship as the shared cultural characteristics that have a positive relationship with trust guarantee that client and partner are sharing the same reference frame. Similarly, the study of (Ko, 2014) and (Ko, Kirsch, & King, 2005) showed that trust between clients and partners have a positive impact on their evaluation of ERPS outcomes. On the other hand, (Tsai et al., 2011) demonstrated that satisfaction of ERPS implementation is mainly linked with both the degree of satisfaction as well as the quality of the service of ERSP vendor and consultant.

7.8. Organizational Factors

Various literature reviews referred to that a firm's culture and structure has a pivotal part in the achievement of ERPS execution. The way of organization behave contains learning and improvement, sharing of the power, joint effort, and support, and risk resistance (Weiling & Kwok, 2008). Moreover, the measurements of association culture assume an essential part in sharing learning through the execution of ERPS (Jones, Cline, & Ryan, 2006). Nonetheless, in the investigation of (Ifinedo & Nahar, 2016), they exhibited the association of estimate is emphatically connected with progress. Accordingly, the extent of the firm is vast, at that point it is getting a charge out of more achievement of ERPS execution. Likewise, they found that accomplishment of ERPS execution will be higher if both specialization and formalization very much dug in and the structure of summons and control exists. While (Sasidharan, Santhanam, Brass, & Sambamurthy, 2012) demonstrated the sharing of information among the colleagues, were importantly affect for both official and individual level of ERPS results. Along these lines, they proposed learning through social communication in the usage of ERPS design.

7.9. Macro Factors

Some literature reviews focus on the factors of macro level as CSFs for the implementation of ERP. For example, the study of (Sheu, Chae, & Yang, 2004) showed such factors that play an important role in ERPS implementation like language, culture, politics, regulations, and worker skills. Similarly, the study of (Krumbholz, Galliers, Coulianos, & Maiden,

2000) used a dataset from the UK and Scandinavian plants of a large pharmaceutical company to demonstrate the effect of culture in ERPS package. They found that there is a high relationship between them.

7.10. User Engagement

User Engagement is foremost among the essential CSF of ERPS execution which implies the contribution of the client during the implementation process. In any case, (Wagner & Newell, 2007) noticed that client inclusion is not a powerful way and does not have significant advantages in the beginning times of ERPS usage. Moreover, the client inclusion in the phase of customization and design is not profitable as they search for business forms mechanization as opposed to wrecking them (Hammer M., 1990). While in the investigation of (Lyytinen & Newman, 2015), they found that the administration and the usage group underestimated the client to actualize the ERPS effectively. The purpose for that was the most demands of them dismissed with a specific end goal to force the perspective of specialized administration.

7.11. Risk Management

Most of the literature reviews cited risk management as one of the essential CSFs that impact on the implementation of ERPS. However, the most of ERPS researchers focus on identifying the risk factors. (Aloini, Dulmin, & Mininno, 2007) (Sumner, 2000) instead of managing them effectively. However, the risk factors including the lack of implementation of some CSFs like the lack of top management support, or change management, or business process re-engineering. The study of (Ojala, Vilpola, & Kouri, 2006) used the risk management approach in the adoption, acquisition, and implementation of ERPS project and they proposed making re-assessment of risk in the phase of maintenance every year. Likewise, (Zafiroopoulos, Metaxiotis, & Askounis, 2005) proposed using the dynamic risk management tool in the process of modeling, adaptation, and implementation of ERPS project. Based on the above studies, it is found that CSFs are too fragmented, which is considered as one of the limitations of them. So, we need to return to the original definition of CSFs of ERPS implementation in order to reduce the fragmentation by finding the common terms that have the same definition (Daniel, 1961) (John F. Rockart, 1979).

8. Results

Surprisingly, identifying all the CSFs creates a puzzle instead of helping the organization to implement ERP successfully as many factors should be considered. Another important finding was that many factors in table 1 are related to each other like project management, project scope, project planning, and project champion. So, they should not appear in isolation from each other, but we should back to the original definition of CSFs as (John F. Rockart, 1979) to put them into a common term. Together these results also provide valuable insights that CSFs of ERPS implementation are industry-specific, company-specific, as well as manager specific and this finding was in alignment with the studies of (Daniel, 1961) and (John F. Rockart, 1979). Thus, they are not adjustable to be one size fit all organization.

9. Conclusion

The execution of ERPS is one of the high-hazard extends that ought to be overseen appropriately with a specific end to pick up profits by it maintain a strategic distance from potential disappointments. The current paper was analyzed the CSFs of ERPS usage from 2000 to 2015, and it contended the backpedaling to the first meaning of CSFs, which help the organizations in centering their endeavors to enhance observing, controlling, and productively overseeing them. This exploration has hurled numerous inquiries needing further examination. For instance, if CSFs of ERPS usage will vary over the time and influenced by the advancement of innovation and along these lines, another CSFs will show up, and a portion of the current ones will vanish. What is more, is that they are will vary in their criticism in light of the attributes of the nation like created or creating nations as well as the technology evolution.

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