International Journal of Engineering Research and Development
e-ISSN: 2278-067X, p-ISSN: 2278-800X, www.ijerd.com
Volume 11, Issue 11 (November 2015), PP.68-74

Focus on Critical Success factors in ERP Implementation

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Abstract:- This research work studies the critical success factors in ERP implementation problems during implementation phases. A multiple case study research methodology was adopted to understand how ERP systems could not be implemented successfully. An ERP life cycle framework was applied to study the ERP implementation process and the associated problems in each phase of ERP implementation. Various critical failure factors were identified and analyzed, and three common critical failure factors like poor consultant effectiveness, project management effectiveness and poor quality of business process re-engineering were examined and discussed. It is hoped that this study will help to bridge the gap and provide practical advice for both academics and practitioners.

Keywords:- Critical Failure Factors, ERP Implementation, ERP Life Cycle.

I. INTRODUCTION

An ERP system is an integrated software solution, typically offered by a vendor as a package that supports the seamless integration of all the information flowing through a company, such as financial, accounting, human resources, supply chain, and customer information (Davenport, 1998). ERP implementation is a lengthy and complex process, and there have been many cases of unsuccessful implementations (Parr and Shanks, 2000), which have had major impacts on business performance. As ERP plays a very important role in business, ERP implementation and its critical issues, success factors and implementation problems have been investigated in the past (Parr and Shanks, 2000; Majed et al., 2003; Soh et al., 2000; Sumner, 2000).

ERP implementation is not just technical implementation, it include complete business process transformation. Business consultants can perform the role of change facilitator and are involved in very important knowledge transfer. The consulting firm engaged in this implementation uses techniques such as guided learning, formal training and knowledge creation activities to direct clients to the necessary knowledge required for a successful implementation. This guidance saves the client considerable time and effort in knowledge search costs (Gable, 2003).

It has been found that the mismatch between ERP and organization can have significant impacts on organizational adoption, and this could be the main reason causing the ERP implementation failure (Umble et al., 2003). The need for greater customization of ERP software will increase in this case, and the risks associated with the ERP implementation will be much higher (Soh et al., 2000). According to Soh et al. (2000), there could be different levels of mismatch, namely business function, data and output.Careful selection and evaluation of ERP systems is required in order to reduce the potential risk of software mismatch.

Different ERP implementation phases are associated with specific ERP implementation problems (Markus et al., 2000). The ERP implementation analysis has provided a solid theoretical background to ERP research. However, our study suggests that there seems to be insufficient research investigating the failure of ERP implementation from planning to post ERP implementation.

II. BACKGROUND AND STUDY OF ERP IMPLEMENTATIONS

There have been many reports of unsuccessful ERP implementations within business, including accounts of the inability of Hershey to ship candy at Halloween, Nike losing shoe orders, and Foxmeyer's failure to process orders (Cotteleer, 2003). Majed (2000) reported that 70% of ERP implementations did not achieve their estimated benefits. In other studies, the percentage of ERP implementations that can be classified as "failures" ranges from 40% to 60% or higher (Langenwalter, 2000), and failures of ERP system implementation projects have been known to lead to problems as serious as organizational bankruptcy (Bulkelery, 1996; Davenport, 1998; Markus et al., 2000).

Practitioners tend to discuss the impact of the failure of ERP implementation in a relative sense, referring to the shutting down of the system, being able to use only part of the ERP system, suffering business loss, dropping market price, losing both market share and competitive advantage due to implementation failure,

and so on (Deutsch, 1998; Diederich, 1998; Nelson and Ramstad, 1999). There have been various statements regarding the failure of ERP implementations. The failure is measured based on Return on Investment (ROI).

As ERP implementation failure rates are so high and impact to the business are high. So, it is compelling to understand the root cause of the failure is imminent. In order to examine the root cause of failure in the ERP implementation process, an "ERP System Life Cycle" (Markus et al., 2000) perspective was adopted, that can help to look at what goes on (e.g., problems experienced and attempts at problem resolution) at each phase of the experience cycle (Markus et al., 2000). Previous research has focused on IS implementation for the definition of IS failure (Lyytinen, 1988). However, the majority of studies have failed to take into account the richness of the ERP failure phenomenon. In this study, we have conducted empirical investigations into ERP failure from the perspectives of management, the project team, and the consultants involved in ERP implementation.

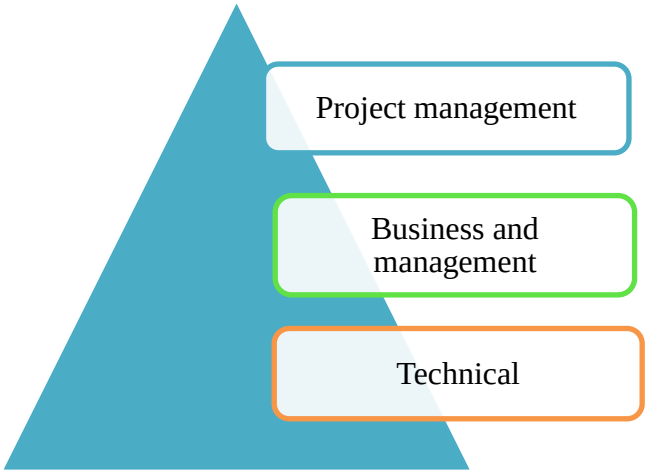
III. THE CASE STUDIES

This section describes the analysis of the data extracted from our selected studies. The contribution of the reviewed implementations in the field of knowledge management in ERP projects is presented, which focuses on the dimensions that should be considered when implementing an ERP project. It shows clearly that various areas of knowledge have been acquired from this study.

There are similarities between the areas of knowledge, and the consistent expression of the need for this knowledge from the case studies emphasizes that this knowledge should be made explicit. These areas of knowledge are organized to a more manageable form in the following section.

From the literature reviewed, three critical dimensions of knowledge are clearly identified for the successful implementation of an ERP system. The three dimensions to be considered for successful implementation are:

Project management knowledge
Business and management knowledge
Technical knowledge.



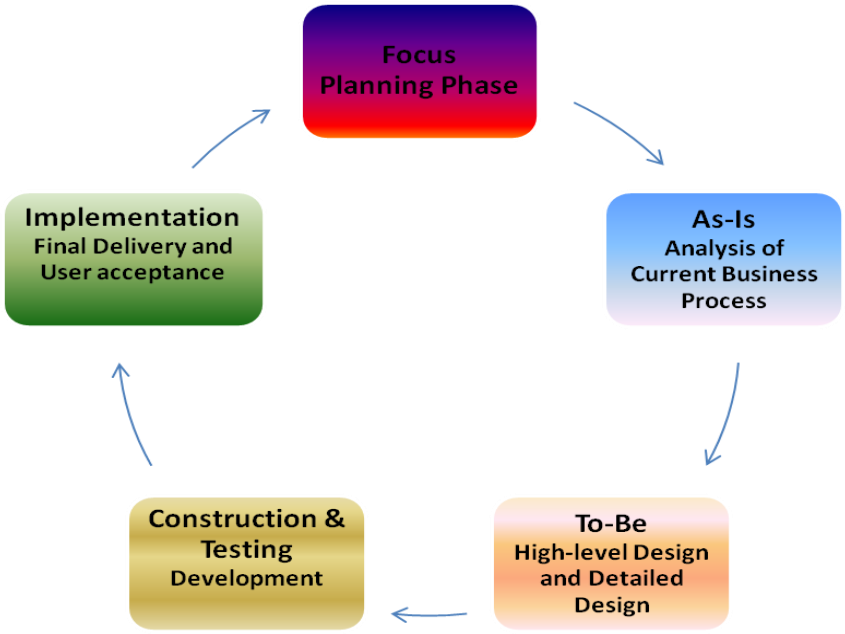
Project management knowledge refers to the knowledge required to manage the entire implementation process as a single project. Business and management knowledge refers to the knowledge about issues and knowledge to deal with these issues during and after implementation. These issues are often people-related and occur on a higher management level. Technical knowledge refers to the knowledge required to install and implement the ERP system (R.Chan 2003).

IV. RESEARCH FRAMEWORK

Many organizations appear to underestimate the issues and problems often encountered throughout the ERP life cycle (Markus et al., 2000). Understanding life cycle management issues will also help to direct the ERP research agenda (Chang et al., 2000). A number of phase models in the literature suggest that a specific focus is required within the various stages of ERP implementation. For example, Markus et al. (2000) developed a four-phase process model of ERP implementation consisting of a project phase, shakedown phase, and an onward and upward phase. Also, Parr and Shanks (2000) in examining the actual implementation process, presented a project-phase model. This provides a useful template for organizations planning ERP implementation. Several researchers have developed process models of ERP implementation. In this section we

review three of those models. A company must focus on, evaluate and define relevant company processes in precise detail in order to implement an ERP system. Implementing the ERP system involves a process that begins with planning for the system. After planning is completed, a project team embarks on and then moves through a number of distinct project phases. After the system is up and running, there may be a post-implementation review and later a stabilization phase. As several authors (Markus et al., 2000; Parr and Shanks, 2000) have stated, the implementation process of an ERP system is best conceptualized as a business project rather than the installation of a new software technology.

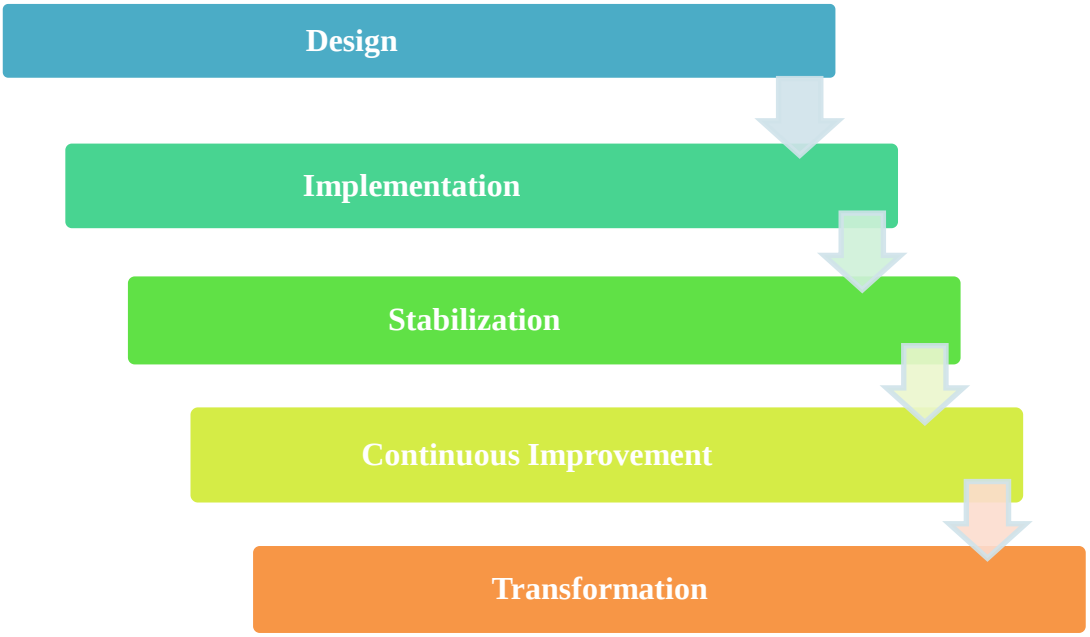
Bancroft et al. (1998) presented a view of the implementation process which was derived from research involving discussions with 20 practitioners and from studies of three multinational corporation implementation projects. The Bancroft et al. (1998) model has five phases: focus, as is, to be, construction and testing, and actual implementation. The "focus" phase can be seen as a planning phase involving the setting-up of the steering committee, selection and structuring of the project team, development of the project's guiding principles, and creation of a project plan. The "as is" phase involves the analysis of current business processes, installation of the ERP technology, mapping of business processes on to the ERP functions, and training the project team. The "to be" phase entails high-level design, and then detailed design which is subject to user acceptance, followed by interactive prototyping accompanied by constant communication with users.



Ross (1998) has developed a five-phase model based on 15 case studies of ERP implementation. The phases of this model are; design, implementation, stabilization, continuous improvement and transformation. The design phase is a planning phase in which critical guidelines and decision making for implementation is determined. Ross' (1998) implementation covers several of Bancroft et al.'s (1998) phases: as is, to be, construction and testing, and actual implementation. Ross' (1998) stabilization phase occurs after cut-over, and is a period of time for fixing problems and improvement of organizational performance. This is followed by a continuous period of steady improvement when functionality is added. Finally, transformation occurs when organizational boundaries and systems are maximally flexible.

Markus et al., (2000) developed a four-phase model of ERP implementation: chartering, project, shake-down and an onwards and upwards phase. The chartering phase begins before Bancroft et al.'s (1998) focus and Ross' (1998) design phases. It includes the development of the business case for the ERP, package selection, identification of the project manager, and budget and schedule approval. The description of their project phase is similar to Ross' (1998) project phase and it covers four of Bancroft et al.'s (1998) phases (as is, to be, construction and testing and actual implementation). The main activities of Ross' (1998) project phase are 'software configuration, system integration, testing, data conversion, training and roll-out' (Markus et al., 2000). Markus et al. (2000) onward and upwards phase is essentially a synthesis of Ross' (1998) continuous improvement and stabilization phases. There are several points of interests with these three models. Firstly,

Markus et al. (2000) and Ross (1998) include a planning phase which occurs prior to the actual implementation project. Secondly, these two models collapse the actual implementation project into one discrete unit. In contrast, Bancroft et al. (1998) categorized the stages of the actual project into four project sub-phases (as is, to be, construction and testing, and actual implementation). Thirdly, two of the models (Ross, 1998; Markus et al., 2000) include a post-project phase (which are referred to as either continuous improvement, transformation, or onward and upwards) in the model of the whole ERP implementation enterprise. None of them relate critical success factors or critical failure factors to the phases of implementation



Markus et al.'s (2000) model could be adopted with an enhancement to measure failure and identify failure factors, as their model is flexible in including detailed elaborated activities and problems associated in each phase (starting from planning to post-implementation). Details of different phases in the research framework will be briefly illustrated as follows: 1. Chartering Phase: decisions defining the business case and solution constraints; 2. Project Phase: getting the system and end users up and running; 3. Shakedown Phase: stabilizing, eliminating "bugs", getting to normal operations; 4. Onward and upward Phase: maintaining systems, supporting users, getting results, upgrading and systems extensions.

V. DISCUSSION

By comprehensive review on enterprise system knowledge management, this paper investigated the major concerns of the different lines. The first area concerns the effects and implications of the tacit category of ERP-specific knowledge. The subject of tacit knowledge management is addressed extensively in the literature and different issues along with their respective mitigating solutions are provided in various research works (J.Arent & J.Nørbjerg 2000, A. Aurum et.al 2003, F.O. Bjørnson & T. Dingsøyr 2005). These solutions include the presence of tacit knowledge sharing facilitators during enterprise system implementation (C.Holland et.al

2001, A.F. Buono et.al 2005, A. Aurum et.al 2003) and paying attention to the structure of team interactions and the atmosphere of the team. Proper utilization of each method can assist the adopting organization to overcome the difficulties of tacit knowledge sharing. Organizing communities of practice composed of the different groups involved in different stages of the enterprise system lifecycle is another way to overcome the difficulties of transferring such knowledge from where it resides to where it is needed. In the case of running the enterprise system project on distant locations (F.O. Bjørnson,& T. Stålhane 2005), virtual communities centered on company intranets or the internet act as the facilitating bridge among separate bodies of knowledge across the entire enterprise.

The process-based nature of organizational knowledge is the second area of concern in enterprise system knowledge management which was examined from the lens of organizational memory (J. Huang et.al 2001, M.Jones 2005). Organizational processes embed substantial knowledge of the organization's history and can be regarded as the organizational memory. Viewing the ERP knowledge through the lens of organizational memory sheds light on some interesting issues of concern in ERP implementation projects (M. Jones &R. Price 2004, J. Kallinikos 2004). Arranging powerful core enterprise system implementation teams and effective utilization of external consulting were identified to be among the most preferred methods of dealing with the knowledge barriers connected with enterprise system configuration caused by difficulties associated with organizational memory. The standardization which results from adopting the same best practices of enterprise system packages by many organizations might give rise to concerns about losing competitive advantage. In particular, the two subjects reviewed here are very illustrative.

Finally, managing ERP-related knowledge across its lifecycle (pre-implementation and post-implementation) is also an interesting area. For example, exploiting the contribution from disciplines such as ontology engineering into this area would give benefits within the context of ontology-based applications for enterprise systems. This may enhance the whole performance of ERP lifecycle knowledge management activities. An initial insight into this direction is systematically presented in (M. N., Ahmad et.al 2011) and an example is available from previous work such as (G. C., Peng,&M. P. Nunes 2009).

VI. IMPLICATION FOR FUTURE RESEARCH

In order to reduce the ERP implementation failure rate, it is useful to establish a robust framework of critical failure factors analysis. The interrelationship between the factors should receive more attention in future research. Prior research has indicated that critical success factors can affect each other in a reinforcing manner (Akkermans and Van Helden, 2002). It would be beneficial in future research on critical failure factors to consider how certain factors affect each other in a reinforcing manner. We have discovered that poor ERP consultant effectiveness and poor project management effectiveness could be the causes of low quality business process transformation, which in turn contributes to users' resistance to change. In future research studies, it is suggested that researchers investigate the kinds of professional advice and knowledge that can be provided by ERP consultants in specific phases of the ERP system life cycle.

Multiple case studies with various industries (e.g., service, trading and manufacturing) and various organizational sizes (e.g., small, medium and large) can be conducted to identify the reasons for implementation failure. Specific industries or organizational sizes might have different organizational characteristics and business requirements for ERP systems, and this may have an influence upon critical failure factors. All of these possible factors could help to create a robust research framework and model which may be useful for understanding the critical failure factors for ERP implementation.

VII. CONCLUSION

This paper focuses on research method and follows the ERP life cycle framework to identify ERP implementation associated problems.Project managers should exercise effective control and monitoring of the ERP project and ERP consultant effectiveness. Business process should also receive attention for all ERP implementation projects, as this factor is important for matching business processes to ERP system functions. It is hoped that more studies will be conducted in future in order to further examine the black box of ERP implementation failure and enable both practitioners and academic researchers to discover the best ways to reduce the failure rate of ERP implementation.

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