CRITICAL SUCCESS FACTORS FOR ERP SYSTEM IMPLEMENTATION TO SUPPORT FINANCIAL FUNCTIONS

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ABSTRACT

Implementation of enterprise resource planning systems is a complex technological and organizational business undertaking that requires the knowledge of a process approach to overcome its implementation constraints. The purpose of this study is to determine factors that are considered critical for successful implementation of enterprise resource planning systems within the financial system of an organization. To achieve this, it is necessary to first identify common factors impacting on enterprise resource planning system implementation and thereafter ascertain whether the identified factors are applicable to financial systems. With these factors forming precursor, this study performs an exploration of enterprise resource planning systems to support financial business process. In aggregate, 205 common factors have been identified from 127 studies, of which 20 dominance factors are presented in this paper. The common factors are then ranked based on median statistics to select top 6 critical success factors that are succinctly discussed within the context of a financial system.

Keywords: Enterprise Resource, Financial Function, Higher Education, Success Factor.

INTRODUCTION

The deployment of Enterprise Resource Planning (ERP) system has been substantively beneficial to many organizations. However, not without constraints such as inappropriate usage, failed system implementation and real-time challenges. In an ERP environment, there has been a significant transformation of titanic business financial roles with certain financial functions not supported. The purpose of this research is to identify successful factors of ERP system implementation that are important for supporting financial functions in the salary unit of Higher Education Institution (HEI) as a concerted effort to minimize the high failure rate of ERP implementation in developing countries. This study conducts a comprehensive exploratory literature review of Critical Success Factors (CSFs) of ERP system implementation that would support financial functions with respect to the following overarching objectives.

1. To identify a minimum set of critical success factors for ERP system implementation that would support financial functions.
2. To explore the significance of each critical success factor in a financial sub-system mediated by successful implementation.

Exploratory study on several journal articles obtained from online databases, particularly those of the web of science were meticulously studied to identify CSFs of ERP systems

implementation. The articles provide contemporary knowledge on CSFs for ERP system implementation that supports financial functions in organizations. An empirically validated minimum set of CSFs has been identified to understand the critical factors require mediating a successful ERP system implementation. The intrinsic benefits of this study will be to further provide a foundation for additional inquiries from scholars and insight to practitioners for successful ERP systems implementation.

The methods of this study are discussed in the methodology section with special emphasis on the identification of CSFs of ERP systems implementation. In total, 205 factors were identified from the literature review of 127 studies and reduced to top 20 factors that were taken through a ranking procedure to select top 6 CSFs within the context of a financial system.

LITERATURE REVIEW

ERP Systems

The enterprise environment of the modern technological world is facing the need to be reformed to gain competitive advantage and differentiation in every sector. Implementing new Information System (IS) like Enterprise Resource Planning (ERP) system is one of the fastest and most effective ways to achieve enterprise reformation (Chen et al., 2012, Thompson et al., 2018). ERP system is considered by researchers and practitioners as one of the most innovative development in IS for efficacious management of information (Ahmad & Cuenca, 2013, Françoise et al., 2009). ERP implementation is essential for building a strong IS infrastructure that unified business functions to automate and integrate core processes across departments in organizations (Ghuman & Chaudhary, 2012; Mutongwa & Rabah, 2013). The ERP system as elucidated by Boykin (2001); Chen (2001) and Yen (2002) is said to be a business management system that when successfully implemented, manages and integrates all business functions within an organization. ERP supports efficient operation of business processes by integrating business task relating to sales, marketing, manufacturing, logistics, accounting and staffing. ERP systems are an indispensable facet of the seamless and efficient operation of organizations (Beatty & Williams 2006; Chen et al., 2012; Antoniadis et al., 2015).

However, there are significant impacts on the role of accounting brought by the implementation of ERP system. Account functions have been changed and consolidated with other functions not supported. Chen et al. (2012) summarize the operations under ERP environment related to accounting functions. These functions are data input, general accounting transactions, data compilation and filling, data adjustment and amendment, financial analysis, risk management, enterprise risk assessment, system maintenance, system evaluation, communication and coordination among departments, integration of cost data relating to the operation, participation in management decision making, computer auditing, forensic auditing plus education and training. ERP involves the combination of various functional information systems and many organizations apply ERP to the specific functional areas within organizations (Kumar & Van Hillegersberg 2000; ALdayel et al. 2011; Erkan, 2011). A phased life cycle is used during the implementation of any sub-system and it is followed by a post-implementation phase that incorporates maintenance, upgrade and a new integration of existing sub-systems (Motiwalla & Thompson, 2012). These sub-systems in many organizations are in need of continuous improvement to stay aligned with current demands for technologies and addressing emergent needs.

Despite ERP systems being crucial business systems that provide mammoth inherent benefits such as improving the effectiveness and efficiency of corporate IS infrastructure and enabling integration of global business processes (Al-Nafjan & Al-Mudimigh 2011; Karande et al., 2012; Xu & Quaddus, 2013), there have been failures and dissatisfaction reported by many companies such as failed ERP system implementation, inappropriate usage, ERP system complexity, overspent budget and outright implementation delay (Fui-Hoon Nah et al., 2001; Belfo & Trigo 2013; Mushavhanamadi & Mbohwa 2013; Kalema et al., 2014; Shatat 2015; Tobie et al., 2016). Resultantly, these phenomena have been confronted by researchers using the taxonomy of previous research (Ngai et al., 2008; Shaul & Tauber, 2013) to identify factors of a successful ERP implementation (Maditinos et al., 2011; Ahmad & Cuenca, 2013; Shatat 2015; Thompson et al., 2018). Some researchers have expressed a shortfall of literature that addresses these challenges in HEIs where the failure rate is said to be higher than in other organizations and the lack of contextualisation of ERP implementation in Africa (Abugabah & Sanzogni, 2010; ALdayel et al., 2011; Karande et al., 2012; Kalema et al., 2014; Thompson et al., 2018).

These success factors are apparent for financial systems where there exists little or no research. Sammon and Adam (2010) agree that ERP system implementation in an organization requires the knowledge of the process approach, a specific organization, environment and competition plus information technology. Though there is significant experience in organizations, the implementation of ERP systems in the financial sector requires cognitive and practical studies. Some researchers have expressed that ERP system implementation brings changes to certain organizations, processes and the nature of the jobs (Chen et al., 2012; Belfo & Trigo 2013; Trigo et al., 2014). Due to the nature of certain jobs in financial sectors being altered before, during and after ERP system implementation, plus inadequateness of ERP for financial functions (Arnold, 2018), ensuring the success of the system implementation to support financial functions becomes an important undertaking that needs to go beyond identifying and proposing a taxonomy of CSFs.

Critical Success Factors

Critical Success factors (CSFs) are those areas and activities to be primarily focused on to achieve the most satisfying results of an ERP system implementation (Bueno & Salmeron 2008; Amid et al., 2012; Ziemba & Oblak, 2013). Prevalent literature exists on CSFs for ERP implementation for the whole life cycle in organizations. However, there is a shortage of research conducted on post-implementation and particularly on the financial sub-system with the implementation of ERP system in higher education (Rabaa'I, 2009; Abugabah & Sanzogni, 2010). Hence, this study posits a gap in the body of knowledge in this area and endeavours to contribute by establishing a set of CSFs for ERP post-implementation system. At the same time, it extends the existing literature in the stream of higher education ERP systems in general and financial sub-systems in particular.

According to Motiwalla & Thompson (2012) the proliferation of ERP systems continues and will continue at a rapid pace with new generations of technology systems capitalizing on what has already been accomplished. However, there are issues of system maintenance, upgrade, job consolidation and even higher failure rates often experienced by many companies during and after ERP system implementation, especially in an HEI sector (Abugabah & Sanzogni 2010; Garg 2010; Belfo & Trigo 2013; Mushavhanamadi & Mbohwa 2013; Thompson et al., 2018). Research on ERP system implementation is importance because of its direct impact on

companies around the world seeking to improve their internal efficiencies. An iterative process involved in the life cycle of ERP system implementation is maintenance and update (Nah & Delgado 2006). However a large amount of research on CSFs of ERP system implementation focuses predominantly on the implementation phase. However, they are lacking in pre-implementation and post-implementation with findings being repetitive, inconsistent and lacking empirical validity (Esteves & Pastor, 2000; Finney & Corbett, 2007; Hedman, 2010; Matende & Ogao, 2013; Ali & Miller, 2017).

Critical review of literature highlights the need for the dynamic nature of CSFs to be carefully considered because though the discussed factors are deemed important, their relevance varies with time (life-cycle stages) and across stakeholders (Ahmad & Cuenca 2013; Thompson et al., 2018). Certain authors, Finney & Corbett (2007) and Dawson & Owens (2008) have indicated the lack of adequate research into the significance of CSFs. While Esteves & Pastor (2006) identified success criteria within a single ERP system implementation phase. Yu (2005) supports the call for further examination as many organizations shift their strategies towards improvements or additions to already implemented ERP systems. Added to this, Ram et al. (2013) and Ijaz et al. (2014) contend the large differences in success criteria for pre-implementation as opposed to post-implementation of an ERP system. The investigation by Shaul & Tauber (2013) on success criteria in ERP system implementation unveiled a serious deficiency of literature on post-implementation issues, strategies and methods to address them. These authors have called for more research to investigate the success criteria for the adoption and usage phase of ERP system, particularly individual phases in the context of HEI sector (Rabaa'I, 2009).

Literature also revealed other criticisms such as studies being vendor specific, minimum focus on other ERP products commissioned by HEI sector and CSFs derived from methods that lack scientific rigor and the need for more innovative research techniques (Thompson et al., 2018). A shortcoming with the majority of studies, emphasized on companies in developed countries with very little work focussing on developing nations like South Africa (Hsueh-Ju Chen et al., 2012; Ram et al., 2013; Shaul & Tauber, 2013; Kalema et al., 2014). These authors criticize the majority of existing research in their mainly theoretical literature based analysis and call for CSFs studies to account for the continuous technological development.

METHODOLOGY

The substantial upsurge in challenges of ERP system implementation, especially in organizational environment has demanded for a better understanding of factors that are critical to its success. Consequently, the need for extensive literature review utilizing a systematic methodology to unveil different success factors of ERP system implementation. This study involves content analysis of existing literature and case studies of research on CSFs of ERP system implementation.

Preceding a comprehensive literature review, the researchers have employed the utilization of search engines to retrieve related research papers that provided the required data (Dantes & Hasibuan, 2011; Kalema et al., 2014). Those articles containing references to the ERP system implementation have been analyzed in-depth. For the purpose of providing adequate response to the question of "w*hat are the critical factors for successful implementation of an ERP system in the financial system*?" These articles were identified through an exhaustive literature search of prominent journals and databases on Management Information System (MIS)

including, but not limited to those outlined in Table 1. In addition, the selection of articles was based on the results of searches that were conducted using keywords and phrases from previous authors of articles reviewed. The searches were restricted mostly to scholarly or peer reviewed journals. The actual selection of articles for inclusion in the literature review was heavily dependent on the perspectives of the researchers. After reading and ruminating on paper titles and abstracts, it was possible to determine whether an article could contain information that is relevant to the theme of the research or not. The articles were then used for further review or otherwise excluded from consideration for the study.

Table 1
INFORMATION SOURCES: JOURNALS, DATABASE AND SEARCH KEYWORDS

Journal	Keyword
Information management	ERP system
Journal of management information systems	CSF and ERP system
MIS quarterly	Impact of ERPs in financial
The African journal of information systems	ERPs implementation
International journal of human and social sciences	CSF for ERPS in higher education institution
Management sciences	CSF for ERPs implementation and financial
Databases	Financial system and ERP system
Emerald Insight	Accounting information system
Science Direct	
ProQuest	
Elsevier	
Web of science	

Given that the purpose of this study was to gain an in-depth understanding of different CSFs for ERP system implementation, the already identified factors by other researchers through the content analysis method was appropriate for the current study as suggested by previous authors (Silverman, 2002; Finney & Corbett, 2007). CSFs have been identified across the phases involved in the ERP system implementation process (Supramaniam & Kuppusamy 2010; Shaul & Tauber, 2013). A comprehensive study was done by Finney and Corbett (2007) to identify 26 CSFs using content analysis after reviewing 70 articles. They considered 45 of these factors that are directly relevant to their study. Extensive review of 341 literature studies by Shaul & Tauber (2013) has revealed 94 CSFs. Moreover, other methods base on case study and literature review has identified CSFs that were categorized into tactical and strategic types. Table 2 highlights few previous studies that have identified, validated and categorized CSFs of ERP system implementation, indicating the authors, number of CSFs identified and the number of articles reviewed.

Table 2
PREVIOUS RESEARCH

Researchers	**Number of CSFs identified**	**Number of articles reviewed**
Finney and Corbett (2007)	26	70
Shaul and Tauber (2013)	94	341
Dezdar and Sulaiman (2009)	17	95
Rabaa'i (2009)	12	110
Supramaniam and Kuppusamy (2010)	22	36
Ngai, Law and Wat (2008)	18	48
Kalema, Olugbara and Kekwaletswe (2014)	37	49

Thompson, Olugbara and Singh (2018)	20	38

DISCUSSION AND RESULTS

The financial subsystem of ERP has been the focal point where industry sectors of enterprises have consistently given careful consideration at all times when implementing ERP systems. This is because an enterprise business performance is mirrored by financial management that intern targets the capital flow. In the implementation of ERP systems, financial management has always been a core module where other modules feed it with information or fetch information from it, making the system important in many organizations. Despite the implementation of ERP system being embraced by many organizations, especially the HEI for reasons, such as reformation, globalization, formalization and modernization, there have been unparalleled opportunities and challenges. Literature reports certain challenges being exposed during the implementation of the ERP financial subsystem as part of the larger ERP suit such as unrealized internal functions of the financial system, integration of financial subsystem, shortage of guidance of modern scientific methods and constant changes to the topology of an enterprise.

The purpose of this study was to unearth the critical factors that impact on the implementation of ERP financial sub-systems. In exploring CSFs for ERP system implementation in the financial sectors, special attention was given to ERP systems supporting financial functions (accounting and finance). A unique set of minimum 20 CSFs has been identified based on frequency statistics as presented in Table 3 and Figure 1. Among these factors, a common CSF identified in extensive literature is the top management support and commitment that received 112 numbers of highest citations.

Table 3
TOP 20 CRITICAL SUCCESS FACTORS

No	Factor	Frequency
1	Top management support and commitment	112
2	Interdepartmental communication and cooperation throughout the institution	87
3	Commitment to business process reengineering to do away with redundant processes	84
4	Implementation of project management from initiation to closing	79
5	A change management program to ensure awareness and readiness for any changes that may happen	72
6	Project team competence (formulation, composition and involvement)	72
7	Education and training for stakeholders (end users, technical and IT staffs)	61
8	Project champion presence to lead the implementation (authorized to use internal and external resources to complete implementation)	51
9	Project mission and goals for the system with the clear objective agreed upon	46
10	The ERP expert consultant uses to guide the implementation process	44
11	Minimum level of customization to utilize ERP functionalities to maximum	44
12	Package selection (carefully and professional selected)	43
13	Understanding the institutional culture (norms, values & beliefs)	40
14	User involvement and participation throughout implementation	40
15	ERP vendor support and partnership	37
16	Business vision and plan	36
17	Adequate IT infrastructure	36
18	Monitoring management, especially evaluation of performance metrics (fast effects)	30
19	Allocating and dedicating valuable resources	29

20	Data management plan that ensures that data are accurately and efficiently migrated to the new system and analyzed properly	27

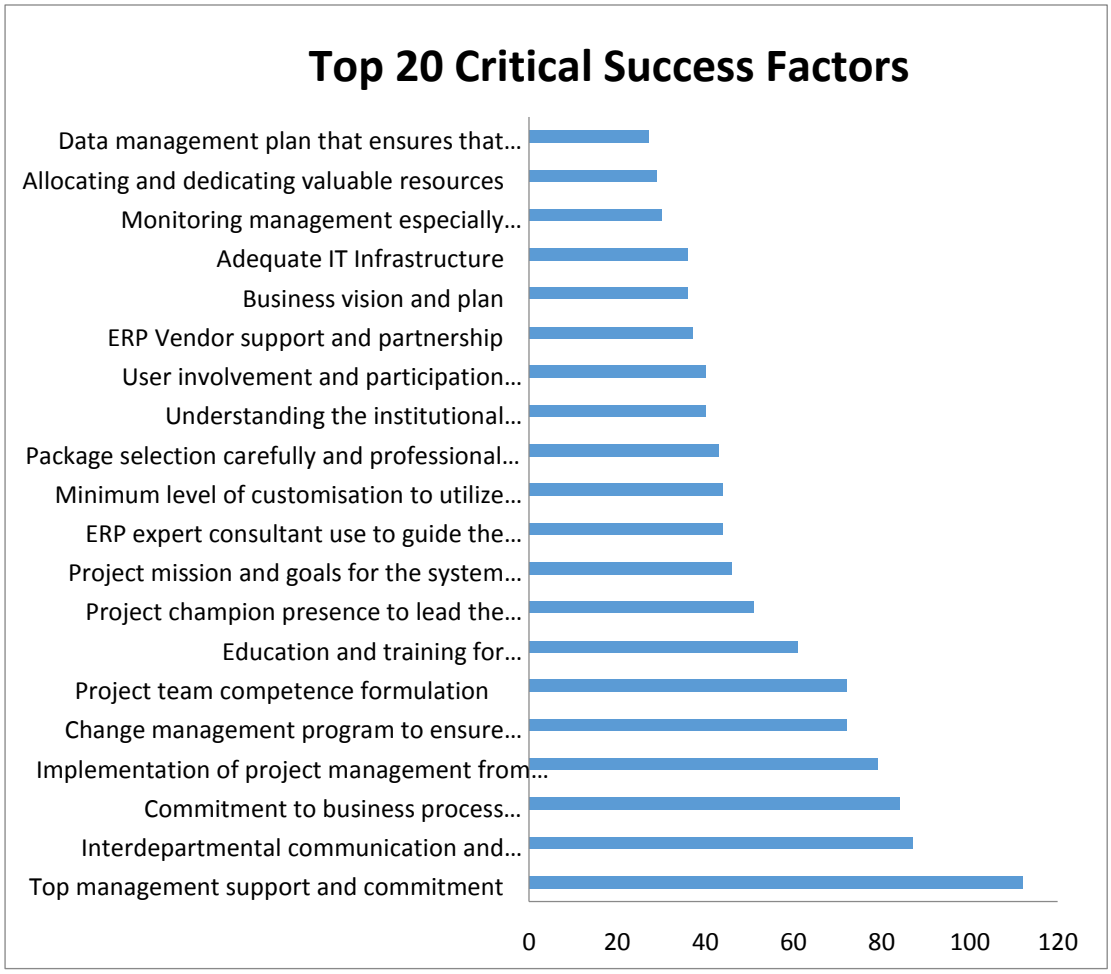

FIGURE 1
CLUSTER BAR CHART OF TOP 20 CSFs

Top 6 CSFs to be discussed in relation to ERP financial system implementation were selected using SPSS software based on the median descriptive statistical analysis on the 205 identified factors. These top 6 factors are top management support and commitment (112), interdepartmental communication and cooperation throughout the institution (87), commitment to business process reengineering to do away with redundant processes (84), implementation of project management from initiation to closing (79), A change management programme to ensure awareness and readiness for any changes that may happened (72) and project team competence (formulation, composition and involvement) (72).

Top management support and commitment is highly relevant for the implementation of an ERP financial system. Given that this factor has been cited by many authors is not a coincidence that it is of high relevance to the financial system. The support can range from authorizing, commissioning and making available the resources needed for the implementation of a financial system. A successfully implemented financial system is an asset to top management who relies heavily on system outputs such as financial reports for decision making. Despite this, many

authors have reported the inadequately of these systems when it comes to reporting, hence the need for attention to be given to this factor when implementing ERP system for financial support (Arnold, 2018).

Interdepartmental communication and cooperation throughout the institution is also a crucial factor for consideration in the implementation of an ERP financial system. The need for open and fluent communication plus cooperation between internal stakeholders, specifically top management and system end users cannot be overlooked. As failure to communicate and cooperate properly are likely to cause failure in the implementation of the ERP financial system (Dezdar & Ainin, 2011; Belfo & Trigo, 2013; Trigo et al., 2014).

Commitment to business process reengineering to do away with redundant processes is also crucial to ERP financial system implementation. The authors, Chen et al. (2012) highlight the massive automation and job consolidation by ERP system. Indicating the new roles that must be aligned to the systematic enforcement (Chan et al., 2012; Dezdar & sulaiman, 2009).

Implementation of project management from initiation to closing entails a broader scope of successful ERP financial system implementation. For a financial system to be successful, a good project management was instituted. To promote the ERP financial system implementation, team building, dealing with conflict and executing objectives of an implementation is important (Sykes et al., 2014). Given that ERP project can tend to be complex, attention needs to be given to ERP financial system implementation (Fui-Hoon Nah et al., 2001; Somers & Nelson, 2004).

A change management program to ensure awareness and readiness for any changes that may happen is relevant to ERP financial system implementation. A change management crosses through diverse aspects in the implementation of an ERP financial system. A change spans a great length ranging from cultural, organizational and structural; hence a stable and successful setting is required for a successful ERP financial system implementation (Finney & Corbett, 2007; Moon, 2007; Dezdar & Sulaiman, 2009; Shaul & Tauber, 2013).

Project team competence (formulation, composition and involvement) plays an important role in ERP financial system implementation. Project team plays a pivotal role because it indicates that the formation, participation and required skills are highly relevant for the success of an ERP financial system implementation (Finney & Corbett, 2007; Moon 2007; Dezdar & Sulaiman 2009; Shaul & Tauber, 2013; Saade & Nijher, 2016).

CONCLUSION AND FUTURE RESEARCH

The success or failure of ERP system implementation, be it in finance or elsewhere can be addressed by identifying CSFs of implementation. However, best practices that are used in ERP system implementation need further verification and adjustment to their specific conditions that support financial functions. Taking into cognizance the roles, regulations and nature of functions in the financial sector, there are major differences between business organizational processes and financial functions. This differential implies that existing successful solutions do not directly apply to the financial system. In particular, ERP system design for organizations does not account for specific financial regulations and government policies.

Though it has been stated in the literature that CSFs vary across the life cycle of ERP system implementation, more studies on CSFs have been done on the entire ERP life cycle with very little on a single phase financial system implementation (Shaul & Tauber, 2013). Some authors have stressed the absence of proper analytical studies to identify CSFs for ERP system

implementation that could establish CSFs interdependency (Supramaniam & Kuppusamy, 2010; Kalema et al., 2014; Thompson et al., 2018).

The findings of this research highlight the necessity for research that looks at CSFs for ERP implementation in a specific sector, such as the financial system with very stringent functional requirements. Moreover, the need for CSFs of ERP implementation research in the financial sector is important because of little research that has been conducted in this sector. It is expected that CSFs discovered in this study will contribute significantly towards understanding the underserved area of ERP financial system implementation. This will pragmatically aid improvement of a process area that is in desperate need of process engineering to support important financial functions in organizations. It is hoped that in achieving the objectives of this study, the requirements for ERP system implementation in the financial system are demystified. This may then serve as a springboard to improve implementation of ERP systems in specific sector of an organization with particular emphasis on the implementation of financial system in developing nation.

A general recommendation to management for the successful implementation of ERP that supports financial functions is to espouse the small set of CSFs divulged in this study. Research gap for future work include the determination of CSFs in the financial domain using a scientifically sound methodology.

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