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Discovery

The review of critical success factors of enterprise resource planning system implementation

Aliyu Usman Shehu[1]✉, Tariro Masunda[2]

Enterprise resource planning systems integrate all functional units within an organization which gives the firm competitive advantage over its competitors. The purpose of this study is to systematically appraise current and previous literature on enterprise resource planning, and investigate the critical factors that determine their successful implementation. The aim of this paper is to review prior studies on Enterprise Resource Planning (ERP) from 2002 to 2016 including implementation benefit/success, factors affecting implementation and implementation successes of ERP. The study employed the use of Systematic Literature Review (SLR). Finally, the study explains the findings of this review regarding contemporary studies on the ERP implementation and factors determining it and in turn highlights implication, conclusion and suggestions for future research study.

INTRODUCTION

In this globalized era, it has become mandatory for firms to integrate information obtained from individual business units into single unit so as to remain competitive. According to (Francoise, Bourgault, and Pellerin 2009), Enterprise resource planning systems are aimed to solve organizational segment division by synchronizing in-house procedures through provision of an assortment of software modules, covering the entire business departments.

Enterprise resource planning (ERP) system is a unified software solution that encompasses an array of business processes that allows corporations to have a complete outlook of the corporation, (Gargeya & Brady, 2005). In addition, as postulated by (Ram and Corkindale, 2014), ERP permits the synchronization of tasks, business segments in terms of information change and movement, and the amalgamation of departments (accounting, finance, HR, operations, sales, marketing, customer information including supply chain, also resultantly producing valuable reports and decision analysis. The successful implementation of ERP systems yields a firm advantages which include, enhanced process flow, improved analysis of facts, higher quality decision making information, less stock-pile ups, enhanced supply chain synchronization, and improved satisfaction of consumer needs, as cited by (Corbett, 2009).

A number of firms have executed ERP system to bolster their processes, so as to gain advantageous edge in the marketplace, because ERP system can practically eliminates the redundancies that happen from separate systems, as the coordination of different activities into one allows information to be processed on real time basis. In addition, four fundamental components of ERP include:

Financial Management: Central to ERP are financial modules and include ledger system, debtors, creditor, asset management and billing systems. When contemplating venturing into global markets a business should ensure that this system is made compatible with numerous monetary forms and languages as well as tailored to uphold, administrative and regulatory system of various nations. This also addresses funds flows all expenditures and tax reporting.

Business Intelligence: Business Intelligence (BI) has become an integral component in many ERP packages. By and large, BI devices authorize users to disintegrate the knowledge obtained from the unified ERP file. BI can originate as dashboards, robotized reporting and examination procedures used to monitor the organizational corporate implementation. BI backs effective and efficient decision making by everybody and from each level of the management of the organization.

Supply Chain Management: Production network Management (SCM), may be described as logistics, augments the resource stream via the organization by administering the scheduling of production, schedule, acquisition, and delivery, to boost consumer amusement and as well as profitability. Sub modules in SCM regularly incorporate manufacturing scheduling, management of demand, distribution, stock, warehousing, acquisition and order management.

Human Resource Management: This module ensures the management of the workers from the time they were employed through their activities and performances in the organization. This module incorporates all information pertaining to the employees of the organization, motivation, incentives and workforce planning.

While organizations are spending considerable amount of money on implementing ERP systems, many researchers are discussing about the

[1]Department of Accounting, Taraba State University Jalingo, Nigeria; [2]School of Accounting, Universiti Utara, Malaysia

✉*Corresponding Author:* Department of Accounting, Taraba State University Jalingo, Nigeria; Email: usmanaliyu53@gmail.com; phone +234(0)7033989596

low rate of usage among potential users (Jofreh, 2013). Without technological acceptance, users use systems to the minimum that is to enter/store necessary data for their daily tasks but not to explore its full features so as to achieve desired goals which lead to competitive advantage (Youngberg *et al.*, 2009).

ERP adoption is around 80 percent in Fortune 500 companies, while failure rate lies between 60 to 90 percent (Sumner, 2000). Moreover, 44 percent of Fortune 1000 companies who had implemented ERP, spent at least four times more than license fee in implementation (Sarker, 2003). Youngberg *et al.* (2009) asserted that ERP failure rates exceeded 50 percent. On the other hand, Motwani (2002) asserted that only 10 to 15 percent of surveyed firms in their study reached their desired performance and the rest of them experienced far from their initial goals and results. Therefore, organizations should consider ERP implementation as one of the riskiest investments (Zabjek *et al.*, 2009), with potential outstanding outcomes and benefits. As ERP systems affect many aspects of a company's internal and external operations, their successful implementation and effective usage are critical to organization's performance (Ngai, 2008).

Rockhart, (1979) defined critical success factors (CSFs) as those precisely notable parts a business ought to get right so as to compete effectively. Considering the executing ERP, the critical success factors, refer to circumstances which have to happen, for effectiveness of the execution procedures. CSFs help companies develop concept for identifying the critical problems that give significant effects to the organizations during implementation. Nevertheless, by determines CSFs (i.e. pre-implementation, implementation and post-implementation) the corresponding solutions and eliminate or prevent the paramount cause of failure in implementations. Therefore, because CSFs are different from organization to organization, industry to industry as well as country to country, it is necessary to carry out a research on success critical components that determine the successful execution of ERP systems. Accordingly, the following research question is hereby examined:

RQ1: What are the factors that are critical to the effective implementation of ERP systems effectively in organizations

LITERATURE REVIEW

ERP success is a vague phenomenon which has attracted various and non-conclusive definitions, including interpretations in terms of technical, economic, financial or strategic business terms of smooth running of business operations and interpretations in light of it adoption by organization's managers and employees, customers, suppliers, and investors (Markus and Tanis, 2000). A substantial amount of human and monetary resources are usually devoted to ERP implementation projects hence a number of researches have cited people, organizational, and change management rather than technological conditions as being the most challenging factors in the implementation process (Botta-Genoulaz and Millet, 2006).

In addition, ERP implementation involves a complete revamping/overhaul of all existing business processes in line with best practice (Motwani et al., 2002). A number of elements that may disturb the ERP implementation process and the likelihood of transformation accomplishment have been recognized in the IT execution, Amongst the more essential features are top management support and involvement (Duchessi et al., 1989) the need for a project champion (Ehie and Madsen, 2005), user training (Stefanou and Revanoglou, 2006; Sameer Pavan Alapaty and Prasad, 2016), technological competence, process delineation, project planning, change management and PM (Krumbholz and Maiden, 2001; Ogbo et al. 2018). Nah and Zuckweiler (2003) highlighted that adequate training can help increase success for ERP systems. Nevertheless, lack of preparation may result in negative outcomes. This is because the ERP system components are complicatedly related to each other, such that inputting wrong data into any one programme will lead to a *garbage in, garbage out* effect on the running of other modules (Gefen, 2002).

The categorization of 12 ERP success factors by (Al-Mashari, 2002) yielded three measurements linked to the phases of ERP development, which are setting-up, deployment and evaluation. The classification underscored that a clear vision and corporate director is central for the accomplishment of ERP system execution. The success of plans is associated with information, abilities, skills and capabilities of the project manager as well as the choice of the right team participants. Likewise, group must not only be technologically proficient but also comprehend the firm and its business necessities (Al-Mashari et al., 2006). User Involvement and implementation partner or consultant are additional widely mentioned critical success factors in ERP implementation projects, because advisors will regularly be able to offer project as well as change management know-how for client satisfaction (Zhang et al., 2005).

METHOD OF STUDY

Wikipedia defines a systematic literature as the review of the literature that clearly identifies the research question which identify, evaluate, select and fuses all high quality current and previous evidences to that question. The Systematic Literature Review (SLR) is "a method for appraising and translating all accessible exploration pertinent to a specific research topic or question, or area of interest (Kitchenham, 2004). This method is described as the overall best for reviewing literature. Systematic Literature review consist of three main stages which are; planning of review, conducting review and reporting the review (Beheshti, 2006).

Several studies have been conducted by various researchers concerning the invaluable factors that firms should consider in order to positively certify implementation of ERP systems in their organizations. Therefore, this study was motivated by the quest to examine the CSFs that determine effective application of ERP systems by organizations. We began by identifying the relevant papers by making a table/schedule in order to easily understand the contents of these papers. The schedule consists of the article name, author, year, country, critical success factors, context of the study, objectives of the study, and result of each research.

Systematic review examines all the available topics in the subject area, to achieve the aim of this study, articles having a uniform description were selected. Meanwhile, the procedure provided by (Beheshti, 2006) was adopted.

Search process

Valid papers were sought via online databases using the university library access. The databases consist of ACM digital library, Emerald Management plus, Jstor, SAGE Research method, and EBSCOhost. The targeted papers were journals and thesis. We desired to search for papers from 2002 to 2016, so as to examine a wide spectrum from which to examine if there is a change in the focus of CSFs in ERP implementation, from researchers during these eleven years, and in so doing make our research robust and results more generalizable.

Data sources

In order to make sure that relevant materials were not excluded, the following database (as per table 1) were used as the main sources of data. Additionally, searching was also done based on the citations in the examined papers.

Table 1 Electronic databases used in this systematic review

Electronic Databases
ACM Digital Library
Google Scholar
Science Hub
Emerald Management Plus
JStor
IEE Xplore

In the meantime, the list of renowned MIS journals employed in then research, research are itemized in table 2.

Table 2 List of journals

JOURNALS
Journal of Enterprise Information Management*4
Business Process Management Journal*6
Middle East Journal of Scientific research
Journal of Manufacturing Technology Management
Competitiveness Review
International Journal of Advancements in Computing Technology
Industrial Management & Data Systems

Search terms

When searching for the relevant papers the main keyword used were ERP, ERP implementation, CSFs in ERP implementation or CSFs. Once this was done, searched papers were cross checked with the currently downloaded ones to avoid repetition. Owing to the length of the literature review table, it is included as part of the appendix.

FINDINGS AND DISCUSSION

Before doing the literature mapping of the articles, irrelevant articles were eliminated and replaced with relevant ones. To comprehensively realize the purpose of this review as well as for avoidance of doubt the final relevant sample consisted of papers spanning years 2002 to 2016.

From the thorough review of the 15 selected articles, it can be deduced that most of the studies were done in developed countries (U.S.A, Canada, U.K, Belgium, Greece, and Australia) that is 53% while the remaining 47% of studies were conducted in developing countries, specifically China, Malaysia, Iran, Ghana and India. It can be observed that only one study was done in Africa. This is not to say the studies on CSFs of ERP implementation do not exist in this continent, but this review was limited to 15 articles, and this did not happen to fall into the chosen sample.

A comparison of the various articles shows that different researchers studied different characteristics of the subject matter and the context of research also varies. In the study conducted by (Zhang, Lee, Zhang and Banerjee, 2002), the researchers examined the crucial determinants of effectively executing ERP systems, in Chinese firms, and found that BRP has the biggest impact on ERP implementation but has a negative effect on information technology modification emanating from due to anxiety of control loss control by management. Using 44 companies in various industries, (Gargeya and Brady , 2005) investigated the success and failure aspects of embracing SAP in ERP structure execution, and concluded that maintained scope, management support, project teamwork ensures successful SAP implementation, whilst inadequate preparation and untimely preparation and costing led to SAP implementation disaster.

In their study to discover the present writings base of CSFs of ERP implementations and recognize existent gaps in developed countries, (Finney and Corbett, 2009), research identifying CSFs from key stakeholders perspective is lacking as well as there was lack of clarity on change management components, despite it being one of the most extensively applied CSFs. In addition, (Hong,2007), studied CSFs of ERP implementation practices of a leading Chinese manufacturing company and discovered that, the factors regarded as critical were similar to those of developed countries, but in addition cultural characteristics were vital. He found that when ERP implementation was aligned to the Chinese culture, administration as well as style of the organization, success was inevitable.

Furthermore, (Dedzar and Suleiman, 2009) through a content analysis, investigated current literature of CSFs of ERP implementation and identified 17 CSFs (as enumerated on the article mapping), which they concluded could be categorized into five main categories. Additionally, A literature review by (Francoise, Bourgault and Perellin, 2009), who recognized real-world accomplishments that are crucial for handling ERP implementation tasks, found that CSFs enable general understanding of the task being undertaken, thus decreasing the innate doubts.

Moreover, study by (Doom, Millis, Poelmans and Bloeman, 2010) where they examined the CSFs of ERP implementation in Belgian SMEs and identified those success factors that are specific to an SME environment. The results showed that SMEs highly regard the greater number of success factors explained in the research, but they however, disregard flawless explanation of scope and a homogenous infrastructure. In addition, the use of consultants was wide spread with these small firms whom they trusted to supply a wealth of knowhow and understanding.

In their research to comprehend the variation of critical success factors in advanced and less advanced economies, (Moohebat, Chatzoudes and Tsairidis, 2011), found that in developed and developing countries "Change Management" was a crucial determinant in both economies, whilst culture was also a factor to be considered by firms in the less advanced economies. Moreover, organizations in developing economies rely on ERP vendors in contrast to industrialized nations, but underrate commercial procedure revamping (BPR) and suitability concerning ERP and procedure. Dezdar and Anin,(2011), using the context of developing countries to discover the critical success factors (CSFs) of enterprise resource planning (ERP) system, revealed that the entire seventeen factors under their study were relevant to their context (Iranian firms).Top management support stood apparent as tremendously crucial as it facilitates dispute resolution and directional mapping and fit in organizations.

Moreover, (Ram and Corkindale 2014), studied the works on enterprise resource planning (ERP) to find out the methodological explanation of factors in the ERP project implementation stages. Their research proved that an inadequate sum of CSFs have been experimentally considered for their part in, and consequence on, execution achievement or post-implementation performance results.

In their study to investigate factors that contribute to the successful implementation of enterprise resource planning (ERP) systems in U.S manufacturing firms, (Beheshti, Blaylock, Henderson and Lollar, 2014) found that The ERP software has emerged as a fundamental enabler of system integration in organizations to reduce redundancy, improve efficiency, productivity and performance. They also reiterated that firms

introduce ERP not only to improve operations efficiency but to be more responsive to the customer needs in the global economy.

Moreover, (Garg and Agarwal, 2014), examined the success of enterprise resource planning (ERP) implementation based on five identified items, (TMC), (UI), (BPR), PM) and ERP teamwork and composition (TWC) factors at Fortis hospital, Bangalore, India, and their findings showed a significant relationship between top management commitment, user involvement, Business process re-engineering, project management and ERP team work commitment with success of ERP implementation at Fortis hospital. Likewise, (Bansal and Agarwal, 2015) investigated whether there was a causal relationship among seven CSFs associated with ERP projects in SMEs in India, and found that all seven CSFs are important for ERP project implementation and management can use this knowledge to mitigate and manage CSFs.

Consequently, a case study review by (Saade and Nijer,2016), who consolidate the critical success factors (CSFs) as published in enterprise resource planning (ERP) implementation case studies, found that out of 64 reported CSFs that were extracted from the literature and subsequent detailed analysis and synthesis, a total of 22 factors are distinct. These factors which encompass change management, are proposed with five ERP implementation stages.

Appendix 2 on the index page illustrates details the critical success factors used by researchers in the reviewed fifteen articles, and it aims to illustrate which factors are regarded by firms as being critical to the success of ERP systems implementations. This current study in explaining these CSFs, uses a criteria of the most pertinent among the various researchers, and in the context of those pertinent to developing visa vis. developed countries and large visa vis. small firms.

From the table, it is explicitly revealed that regardless of the organization or country of implementation of the system, almost all the researchers specifically (93%) acknowledge that top management support, as being the most critical success factor of ERP system implementation. This can be explained by the fact that, apart from the involvement of altering systems of software, enterprise resource planning also entails the complete overhauling of a firm's entire business processes and practices to suite best business practice. Therefore, in the absence of active participation of top management through their apportionment of valued resources to the project, successful implementation cannot be achieved (Doom, C Milis K, 2011). These individuals should come from various professional disciplines, and possess a assortment of expertise including specialists in information technology, operational personnel and sometimes consultants, so that they are able to resolve misunderstandings that occur and motivate their staff, so that ultimately strategic users of the system have a clear direction of the entire process, and there is goal congruence.

Project management, education and training, as well as user involvement are equally ranked as being the second most important determinants of implementing ERP successfully, in the reviewed articles. When implementing ERP systems, effective project management enables facilitators to develop a project plan which outlines nature, timing and extent of the project. It also directs the accomplishment of the project as well as facilitates effective communicators among all project members (Dezdar & Ainin, 2011). Also, borrowing from (Baerz, Abbasnejad, Rostamy and Azar, 2011), as cited by (Dezdar & Ainin, 2011).

Education and training will equip users with the technical knowhow of ERP software, resulting in easy use of the system. When users are aware of how to use the new systems, this will eliminate the socio-technical problems usually associated with adoption of new technologies in companies, for example employee resistance. Moreover, important to note is that education and training should be long-lasting, and include all aspects of the system, so that users are able to understand the diverse business methods of the ERP system. In furtherance, by involving users from the start of the implementation process, through to its completion, peer knowledge transfer is facilitated so that users who were involved in the onset of implementation can train their co-workers, thus saving the company unwarranted costs of hiring consultants.

Business process re-engineering (BRP) and Change management were ranked as the third most critical success factors. They both include a complete turn-around of aspects of the business, and the key to successfully executing these two processes is to foster a culture of communication in the organization so that everyone is kept abreast of each stage of the implementation process and goal congruence is achieved when everyone is working towards the same objective of implementing an effective system to execute business operations.

Vendor support was perceived as falling in fourth place in terms of importance. The implementers as well as the ERP software providers should develop healthy mutual business relationship to enable the smooth transition of the ERP implementation process. Accessibility of the vendors to the company is vital so that they can address any challenges the latter may have in adjusting to the new system. Furthermore, other critical factors identified in the studies include, project team readiness, planning strategy and vision, communication, use of external and internal consultants, IT infrastructure, software analysis and troubleshooting and organization structure.

With reference to considering the significance of factors in developing and developed countries, studies by (Corbett, S, F, 2009) and (Moohebat, 2010), show that change management is the most critical factor in both economies, even though the former studies state there is lack of clarity on what constitutes change management in developed countries. (Moohebat, 2010) reiterated that culture has an impressive effective on ERP system implementation, and these economies while placing great reliance on vendor support as opposed to their Western counterparts, probably due to the low-level of technological knowhow in most developing countries, placed less emphasis on business process re-engineering.

Consequently, in the context of the factors important to large organizations and small organizations, reference is made to studies by (Zhang, Lee, Zhang, & Banerjee, 2002), (Hong, 2007), (Doom, C Milis K, 2011), (Hooshang M, Beheshti K, B Blaylock A.D, 2014) and (Bansal, V Argarwal, 2015), who conducted their studies either in large manufacturing firms or SMEs. From the findings, it can be deduced that, SMEs regard a combination of factors as being critical to the successful implementation of ERP systems. In addition, these firms usually enlist the services of consultants, whom they regard to be a spring of know-how since the SMEs themselves in most cases, do not have in-house technical expertise. Large business on the extreme, believe that ERP software enables the integration of systems so as to more effectively respond to customer needs and be competitive apart from improving business processes. In the end, these firms also acknowledge that culture should be embedded into the ERP implementation process so as to better align the systems and achieve strategic fit.

Finally, this study analyzes CSFs by separating them into four categories which are organization related factors, project related factors, customization of ERP factors and individual related factors. The rational for analyzing these elements in terms of these four key dimensions is so that management in considering which factors are key to the successful implementation of ERP systems can ensure that they align the attributes

to all essential aspects of the organization. The detailed list of the specific factors that fall into each category is enumerated on Appendix T3, on the index page.

CONCLUSION AND FURTHER STUDY

The resolve of this methodical appraisal was to examine the critical achievement features of ERP system implementation. Though several factors were identified in this study, it was discovered that some ranked higher than others in terms of importance. For example, the most prominent factors across articles included, top management support, project management. Change management, project management, user involvement. In this regard, organizations have to be able to identify the factors that will result in successful implementation of their ERP projects, relative to their varying contexts. Each firm is unique and the ability to align these key implementation factors will determine the success or failure of the ERP system implementation. The aim here is to ensure, that the business becomes more efficient and effective in executing their tasks, since ERP systems enable the integration of various firm functions, thus rendering the firm to be more competitive and ensure sustainability.

In conclusion, in this ever-changing business environment it has become vital for companies to look at culture as a critical success factor of ERP implementation, because it plays a very significant role. Also, the importance of each factor is also congruent to each business, so management must be able to identify which factors influence their individual business situations and needs, if they are to ensure the successful implementation of ERP systems. Future studies could also be conducted to examine the relationship that subsists between ERP implementation and firm's performance. In conclusion since ERP systems are a continuous phenomenon, studies that investigate how post-implementation activities like upgrading and maintenance of ERP software affect the ERP project life-cycle, could also be very useful to business.

APPENDIX: T1 CRITICAL SUCCESS FACTORS OF ERP SUCCESSFUL IMPLEMENATION ARTICLE MAPPING

S/N	TITLE	YEAR	COUNTRY	AUTHORS	CRITICAL SUCCESS FACTORS	CONTEXT	RESEARCH OBJECTIVE	FINDINGS
1	Critical success factors of ERP system implementation in China.	2002	China	L, Zhang, M.K Lee, Z. Zhang and P, Banerjee. .	Top management support, BPR, effective project management, company wide-commitment, education & training, suitability of software & hardware ,user involvement ,vendor support, data accuracy and organizational culture.	Chinese firms	To examine the critical success factors of ERP system implementation in China.	BRP has the biggest impact on ERP implementation, but has a negative effect to technological change due to fear.
2	Success and failure factors of adopting SAP in ERP system implementation	2005	U.S.A	B. Vidyaranya and C.B Gargeya	Maintained scope, project team/internal readiness, Management support/consultants, training, dealing with organizational diversity, planning, development and budgeting and adequate testing.	44 companies in various industries	To examine success and failure factors of adopting SAP in ERP system implementation	Maintained scope, management support, project team ensure successful SAP implementation. Inadequate readiness/training, inappropriate planning & budgeting lead to SAP implementation failure.
3	ERP implementation-A compilation and analysis of critical success factors.	2009	U.K	S. Finney and M Corbett	Top management commitment and support, change management, visionary and planning, build a business case, vanilla ERP, Project management, balanced team, IT infrastructure, and BRP and software configuration, client consultation.	Developed countries	To explore the current literature base of critical success factors (CSFs) of ERP implementations, prepare a compilation, and identify any gaps that might exist	There is lack of research that has focused on the identification of CSFs from the perspectives of key stakeholders. Additionally, there appears to be much variance with respect to what exactly is encompassed by change management, one of the most widely cited CSFs.
4	Critical success factors of implementing ERP: A case of a Chinese electronics manufacturer.	2007	China	H.S Woo	Top management, project team, project management, process change, education and training and communication.	Electronics manufacturing company	To examine the (ERP) implementation experiences of a leading Chinese enterprise, and to provide Chinese	The critical success factors for the case company for implementing ERP is similar to its Western counterparts, with the addition of an

							enterprises implementing ERP with knowledge about ERP implementation critical success factors.	underpinning theme – cultural characteristics. This study found that when an attempt is made to adapt the implementation to the Chinese culture, management and style of the company, implementation is successful.
5	Successful enterprise resource planning implementation: taxonomy of critical factors	2009	Malaysia	S. Dezdar and A Sulaiman	Top management support, Project management, BPR, Team composition, change management, vendor support, business plan and vision, use of consultants, system quality, user involvement, project champion, user training and education, software analysis and troubleshooting, selection of ERP software	Content analysis /Literature review	To investigate the current literature base of critical success factors (CSFs) of enterprise resource planning (ERP) implementations, provide a systematic compilation of CSFs, and present a new comprehensive taxonomy of CSFs for ERP system implementation	By analyzing all CFSs mentioned in literature during the last ten years (1999-2008), taxonomy of ERP CSFs implementation was formulated. In total 17 CSFs were identified, which is then categorized into five main categories.
6	ERP implementation through critical success factors' management	2009	Canada	O. Francoise, M, Bourgault and R. Pellerin	Project team work and composition, organizational culture, change management, top management support, business plan and long term vision, BRP and customization, effective communication, project management, software development ,testing and troubleshooting, monitoring and evaluation of performance, project champion, organizational structure, end user involvement, and knowledge management.	Literature review	To identify practical activities that are essential for managing enterprise resource planning (ERP) implementation projects and that answer to the expectations of the widely recognized critical success factors (CSFs)	The CSFs enable overall grasp of the project is undertaken, thus reducing the inherent uncertainties.
7	Critical success factors for ERP implementations in Belgian SMEs	2010	Belgium	C,Doom,K,Milis,S,Poelmans and E.Bloeman	Senior management support, active user involvement, internal communication, clear vision of strategic goals, corporate culture open to change, proper management of ERP supplier, formalized project approach, project planning, use of external consultants and user training on technical aspects.	SME	To examine the critical success factors of ERP implementations in Belgian SMEs and to identify those success factors that are specific to a SME environment	Most of the success factors found in the literature apply to SMEs. Some factors, such as a clear scope definition and a standardized infrastructure, are not regarded as critical success factors for SMEs. Moreover, SMEs tend to rely relatively heavily on the input of consultants, who they use as a source of knowledge and experience.

8	A Comparative Study of Critical Success Factors (CSFs) in Implementation of ERP in Developed and Developing Countries	2010	Iran	M,R.Moohebat , A, Asemi and M,D.Jazi	BRP, change management, data accuracy, ERP project team, vendor strategy & implementation Fit between ERP & business process, appropriate business, IT legacy, monitoring & performance evaluation, business plan, vision and goals.	Developed and developing countries	To understand is there any difference between ERP Implementation's CSF in developed and developing countries?	In developed and developing countries "Change Management" was most important factor and in developed countries National culture of developing countries has an impressive effect on ERP implementation in these countries. They also depend on ERP vendors in comparison to developed countries companies and underestimate business process reengineering (BPR) and fit between ERP and business/process.
9	Factors affecting ERP system implementation effectiveness	2011	Greece	D. Maditinos, D. Chatzoudes and C, Tsairidis	Top management support, user support, internal & external consultant support, communication effectiveness, conflict resolution, knowledge transfer, ERP system effective implementation	361 Greek companies	To introduce a conceptual framework that investigates the way that human inputs (top management, users, external consultants) are linked to communication effectiveness, conflict resolution and knowledge transfer in the ERP consulting process, as well as the effects of these factors on ERP system effective implementation.	The assistance provided by external consultants during the ERP implementation process is essential; knowledge transfer is an extremely significant factor for ERP system success; knowledge transfer concerning technical aspects of ERP systems is more important than effective handling of communication, as well as conflict resolution among organizational members; the role of top management support seems to be of less importance that the one provided by users.
10	Critical Success Factors for ERP Implementation: Insights from a Middle-Eastern Country	2011	Iran	S, Dezdar and S, Anin	Top management support, enterprise-wide communication, organizational culture, business plan, vision, appropriate business , IT legacy systems, project management, ERP team composition and competence, change management program, BPR, user training and education, software analysis, vendor support, system quality, testing and troubleshooting, careful selection of ERP software,	Developing countries	To explore the critical success factors (CSFs) of enterprise resource planning (ERP) system implementation in context of the developing countries	All the 17 CSF were identified as significant factors for the successful ERP implementation in Iranian companies. Top management support was perceived as extremely critical and important for the processes according to those depicted by the ERP successful ERP implementation in Iran, by playing a useful role in settling disputes and clear direction.

11	How “critical” are the critical success factors (CSFs)?: Examining the role of CSFs for ERP	2014	Australia	J,Ram & D,Corkindale	Organization related, technological / ERP related, Project related and individual related.	Literature review	To examine the literature on enterprise resource planning (ERP) to establish whether the critical success factors (CSFs) for achieving stages of an ERP project have been empirically shown to be “critical”.	The authors have shown that a limited number of CSFs have been empirically investigated for their role in, and effect on, implementation success or post-implementation performance outcomes.
12	Selection and critical success factors in successful ERP implementation	2014	U.S.A	H,Beheshti,B,K Blaylock,D,A Henderson and J,G Lollar	Top management support, project management ,interdepartmental communication, user training and education, clear goals and objectives, change management plan, BPR vendor support, use of consultants, ERP software, org culture, user involvement in evaluation and modification and implementation.	Manufacturing company	To investigate factors that contribute to the successful implementation of enterprise resource planning (ERP) systems in manufacturing firms. Design/methodology/ approach	The ERP software has emerged as a key enabler of system integration in organizations to reduce redundancy, improve efficiency, productivity and performance. Firms implement ERP not only to improve operations efficiency but to be more responsive to the customer needs in the global economy
13	Critical success factors for ERP implementation in a Fortis hospital: an empirical investigation	2014	Ghana	P,Garg and D, Agarwal	Top management commitment, user involvement, BPR, project management, and ERP teamwork and composition.	Hospital	To examine the success of enterprise resource planning (ERP) implementation based on five identified items, (TMC), (UI), (BPR), PM) and ERP teamwork and composition (TWC) factors at Fortis hospital, Bangalore, India	A significant relationship was found between TMC, UI, BPR, PM and ERP TWC with success of ERP implementation at Fortis hospital.
14	Enterprise resource planning: identifying relationships among critical success factors	2015	India	V,Bansal and A Agarwal	Project management, top management support, vendor support, implementation strategy, enterprise system selection process and project team competence.	SME	To establish that there are causal relationships among critical success factors (CSFs) associated with an enterprise resource planning (ERP) projects.	All seven CSFs are important for ERP project implementation and management can use this knowledge to mitigate and manage CSFs.
15	Critical success factors in enterprise resource planning implementation: A review of case studies	2016	Canada	R,G. Saade and H, Nijher	Strong & committed leadership, change champion, vendor support, BRP, top mgt support, business requirements, technical solutions, comm of vision, project imple, usage and org state.	Case studies review	To consolidate the (CSFs) as published in enterprise resource planning (ERP) implementation case studies	Out of 64 reported CSFs that were extracted from the literature and subsequent detailed analysis and synthesis the authors found a total of 22 factors that are distinct. These factors which encompass change management, are proposed with five ERP implementation stages.

APPENDIX T2: ANALYSIS OF VARIABLES

PAPER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
CRITICAL SUCCESS FACTOR																
TOP MANAGEMENT SUPPORT	+V	+V	+V	+V	+V	+V	+V		+V	+V	+V	+V	+V	+V	+V	14
BUSINESS PROCESS RE-ENGINEERING	+V				+V	+V		+V		+V			+V		+V	7
EFFECTIVE PROJECT MANAGEMENT	+V		+V		+V	+V					+V	+V	+V	+V		8
COMPANY WIDE COMMITMENT	+V									+V						2
EDUCATION AND TRAINING	+V	+V		+V	+V		+V			+V	+V	+V				8
USER INVOLVEMENT	+V				+V	+V	+V		+V		+V	+V	+V			8
SOFTWARE SUITABILITY	+V					+V										2
VENDOR SUPPORT	+V				+V			+V				+V		+V	+V	6
DATA ACCURACY	+V															1
ORGANISATIONAL CULTURE	+V					+V	+V			+V						4
MAINTAINED SCOPE		+V														1
PROJECT TEAM READINESS		+V		+V		+V		+V					+V			5
ORGANISATIONAL DIVERSITY		+V														1
ADEQUATE TESTING		+V														1
VISIONARY AND PLANNING			+V				+V	+V		+V						4
CHANGE MANAGEMENT			+V		+V	+V		+V		+V	+V	+V				7
VANILLA ERP			+V													1
IT INFRASTRUCTURE			+V					+V			+V					3
CLIENT CONSULTATION			+V													1
SOFTWARE CONFIGURATION			+V													1
PROCESS CHANGE				+V												1
COMMUNICATION				+V		+V	+V		+V			+V				4
TEAM COMPOSITION					+V											1
USE OF INTERNAL AND EXTERNAL CONSULTANTS					+V		+V		+V			+V				4
SYSTEM QUALITY					+V											1
PROJECT CHAMPION					+V	+V									+V	2
SOFTWARE ANALYSIS& TROUBLESHOOTIN					+V	+V				+V						3
ERP SOFTWARE SELECTION					+V							+V				2
ORGANISATION STRUCTURE						+V					+V	+V				3
SOFTWARE DEVELOPMENT										+V						1
KNOWLEDGE MANAGEMENT						+V										1
PROJECT PLANNING		+V					+V	+V		+V						4
CONFLICT RESOLUTION									+V							1
KNOWLEDGE TRANSFER									+V							1
ERP EFFECTIVE SYSTEM IMPLEMENTATION									+V							1
TEAM COMPOSITION AND COMPETENCE										+V						1

SOFTWARE ANALYSIS										+V						1
SYSTEM QUALITY										+V						1
MODIFICATION AND IMPLEMENTATION											+V			+V		2
ENTERPRISE SYSTEM SELECTION PROCESS										+V				+V		2
PROJECT TEAM COMPETENCE														+V		1
BUSINESS REQUIREMENTS															+V	1
TECHNICAL SOLUTIONS															+V	1
COMMUNICATION OF VISION															+V	1
POST IMPLEMENTATION USAGE															+V	1
ORGANISATION STATE															+V	1

APPENDIX T3: DIMENSIONS OF CRITICAL SUCCESS FACTORS

Organisation-related

1. Organization culture and political structure
2. Top management support
3. Change management
4. Cooperation
5. Change agents and leadership
6. Cross-functional cooperation
7. Management readiness for change
8. Scope for change
9. Management of change
10. Presence of champion
11. Business plan/vision/goals/justification
12. Project justification based on cost and economic scale
13. Retrain IT workforce in new skills
14. Employee moral Technological/ERP-related

Customization of ERP

1. Technological complexity
2. Compatibility
3. Legacy systems
4. Data analysis and conversion
5. Data accuracy

Project-related

1. Project management
2. Training and education
3. System integration
4. Business process re-engineering
5. Full time project manager
6. Communication
7. Minimal customization
8. Implementation strategy and methodology
9. Teamwork and team composition
10. Project team competence
11. Steering committee
12. ERP selection

Individual-related

1. Perceived usefulness
2. Ease of use
3. Attitude towards ERP system
4. Shared belief in the benefit of the system
5. Social factors
6. Facilitating conditions
7. Near-term consequences
8. Long-term consequences

9. Affect (feeling of joy or displeasure with a particular act)
10. Users absorptive capacity
11. Usage performance
12. User satisfaction
13. Learning capacity
14. User involvement

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