CRITICAL SUCCESS FACTORS WITHIN AN ENTERPRISE RESOURCE PLANNING SYSTEM IMPLEMENTATION DESIGNED TO SUPPORT FINANCIAL FUNCTIONS OF A PUBLIC HIGHER EDUCATION INSTITUTION.

By

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DECLARATION

I, AYOGEBOH EPIZITONE, declare that this dissertation is a representation of my own work, both in conception and execution. This work has not been submitted in any form for another degree at any university or institution of higher learning. All information cited from published or unpublished works has been acknowledged.

_____ _____ 02/09/2021

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DECLARATION 2 – PUBLICATIONS

Candidate contributions to scientific knowledge and development in the course of study. The publications output from the research are discussed in this thesis and including journal article published.

DHET ACCREDITED PUBLISHED JOURNAL ARTICLES

1. "Critical success factors within an enterprise resource planning system implementation designed to support financial functions". Best poster award 19th IS conference 2018. www.lis.uzulu.ac.za/conference
2. A. Epizitone, and O. O. Olugbara, "Critical success factors for ERP system implementation to support financial functions," *Academy of Accounting and Financial Studies Journal*, vol. 23, no. 6, pp. 1-11, 2019. DHET Accredited Journals- SCOPUS
3. A. Epizitone, and O. O. Olugbara, "Mixed method approach to determination critical success factors for successful financial ERP system implementation," *Academy of Accounting and Financial Studies Journal*, vol. 24, no. 2, pp. 1-10, 2020. DHET Accredited Journals- SCOPUS
4. Epizitone, A., & Olugbara, O. O. (2020). Identifying critical success factors of financial ERP system in higher education institution using ADVIAN® method. "*International Journal of Advanced Computer Science and Applications"*, 11(9), 389-403. doi:10.14569/IJACSA.2020.0110946. DHET Accredited Journals- SCOPUS-WOS

5. Epizitone, A., & Olugbara, O. O. (2020). Principal component analysis on morphological variability of critical success factors for enterprise resource planning. "*International Journal of Advanced Computer Science and Applications"*, 11(5), 206-217. doi:10.14569/IJACSA.2020.0110529. DHET Accredited Journals- SCOPUS-WOS
6. Epizitone, A., & Olugbara, O. O. (2020). Multiple correspondence analysis of critical success factors for enterprise resource planning system implementation. *Journal of Management Information and Decision Sciences*, Research Article: 2020 Vol: 23(Issue: 3), 175-186. DHET Accredited Journals- SCOPUS
7. M. Siyaya, A. Epizitone, L.F. Jali and O. O. Olugbara, "Determinants of Internal Auditing Effectiveness in a Public Higher Education Institution," *Academy of Accounting and Financial Studies Journal*, vol 25 (2). DHET Accredited Journals-SCOPUS

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ACRONYMS AND ABBREVIATION LIST

- ADVIAN Advance impact Analysis
- A/F Accounting and Finance
- AS Active Sum
- CIA Cross Impact Analysis
- CIM Cross Impact Matrix
- CSFs Critical Success Factors
- DUT Durban University of Technology
- ERP Enterprise Resource Planning
- HEI Higher Education Institution
- HR Human Resource
- IS Information System
- IT Information Technology
- ITS Integrated Tertiary Software
- MIS Marketing and Sales
- PS Passive Sum
- SCM Supply Chain Management

DEFINITIONS

Critical	Necessity for the success of something and, if neglected, has a high likelihood of ruin.
Critical Factors	Factors deemed to hold an extremely high impact on the success or failure.
Critical Success Factors	Restricted essential areas that must be performed correctly to ensure a business achieves success, is competitive and flourishes.
Enterprise Resource Planning (ERP)	Configurable integrated information system implemented across various functional areas of an organisation, combining information and information-based processes.
Framework	General overview of a group of interrelated components that support an approach to achieve an objective. Theoretical framework supports the theory and basis of the research. Conceptual framework is the theory operationalization and expression of the author's stance on the dilemma that defines the study path.
Financial functions	Financial tasks undertaken that is intertwined with the flow of value e.g. "account processing, financial report generation, financial report integration, management, cost management, payroll processing, fixed assets management, financial analysis, decision support, internal fund management, inventory control, purchasing management, sales management"
Paradigm	The fundamental norms and intellectual construct that a field of investigation and development is based.
Taxonomy	Classification or grouping principle.
Variable	A measurable attribute or characteristic that differs between subjects

ABSTRACT

The Enterprise Resource Planning (ERP) system of an organization is a highly significant integrator of various processes of the organization that comes with many intrinsic merits. ERP systems will soon become intelligent enterprise systems as the world shift towards the fourth industrial revolution. This capability will make it significant to resolve the current snags plaguing the systems. Many of the snags that have been encountered and presented by the ERP systems have successfully been curbs with the concept of Critical Success Factors (CSFs). However, the nature and attributes of these factors have been inadequately dissected coupled with the lack of sound scientific methodology to validate the factors. Hence, turning them to be numerous without worth has prompted the quest to uncover CSFs in a sector that experience the most adverse impact is the Higher Education Institute (HEI) and the seldom researched area is the financial sector. The successful implementation of CSFs would significantly aid the efficacy of failing implementation of ERP systems.

The study aims to pinpoint CSFs for ERP system enactment within the financial information system of a public HEI. Exploring four overarching objectives of identifying the minimal lot of CSFs for ERP enactment that would support financial function. To reconnoiter the magnitude of each of the CSFs in the financial sub-system arbitrated by a successful contrivance. To investigate an effective model that when adopted would support financial functions. To give wide-ranging reference to management for the efficient enactment of ERP systems that would sustain financial functions.

To achieve these objectives, a mixed method methodology coupled with a pragmatism philosophy stance was employed that involved literature review, expert opinions, and application of advanced impact analysis technique. In this study, 205 CSFs were aggregated from the related literature and trimmed after a preliminary analysis to yield a minimal set of 20 CSFs that are applicable to the context of financial systems. Each factor was evaluated by a nadir sample size of nine experts through the deployment of an online data collection tool. The opinions of experts generated the Cross-Impact Matrix (CIM)

that was evaluated using the advanced impact analysis (ADVIAN) technique. Application of ADVIAN explores the significance of the CSFs in a financial system. Presenting a resolution to the efficacious enactment of CSFs for ERP systems in HEIs determined by criticality, integration, and stability measurements. Additionally, ranking the CSFs utilizing the precarious, driving, and driven criteria to structure an effective model to assist financial functions. The outcomes can afford an eclectic practical blueprint as an allusion and bearing gage for planning, enacting and utilizing ERP systems to improve organizational performance.

CHAPTER ONE

1.1. Introduction

The disposition of Enterprise Resource Planning System (ERPs) enactment has been concretely advantageous to organizations yet not without constrictions like unsuitable usage, system disappointment, and real-time challenges (Epizitone and Olugbara 2019). In the ERP environment, there has been a momentous alteration of huge corporate financial roles with particular financial tasks not upheld (Epizitone and Olugbara 2019). This dissertation pinpoints factors that are vital and promote financial functions in the ERP financial systems implementation in Higher Education Institutions (HEI), as a means to diminish the elevated failure proportion in developing countries implementing ERP systems. A comprehensive exploratory study of the financial system implementation in a higher education institution mainly Durban University of Technology (DUT) is carried out, and a survey conducted involving key role players in ERP implementation. A nadir sample size of nine experts is used. The selection of experts was based on their system and technical knowledge of the ERP system. The Advanced Impact Analysis (ADVIAN) technique will be applied to data gathered from the survey. The expected contribution is to glean CSFs for ERP system enactment that aids financial functions. Furthermore, enhanced the growing knowledge of ERP system in HEI.

ERP is an Information System (IS) of complex implementation that entails investments with substantial organizational changes whose implementation demands exceptional

precaution to avert additional losses to organizations (Tortorella and Fries, 2015). W Wamicha and Seymour (2015), reported ERP systems to be an amalgamation of business practices hoarded by vendors through historical organizational implementations and that permit business operations restructuring. However, not all implementations have been fruitful given that ERP system implementation upsets the culture, process and individuals of an organization holistically resulting in a sum of dares (Seo, 2013).

Over time, ERPs system has been applied in several organizations worldwide as a practical solution (Moon, 2007) with organizations investing substantially into it. According to Fisher (2006), in HEIs ERP systems was first introduced the USA as a solution for the indistinguishable qualms that propel the private segment to incorporate these systems. Currently, there is a proliferation of these systems in the global market. However, Bhat, Shroff and Bandi (2013), reported ERP system employment in HEIs to be challenging due to the inadequate and unique knowledge involved. Furthermore, Hawking (2011), highlight the unfortunate supposition that developing nations have no challenges in embracing previously existing knowledge.

Prevalent literature underlines the knowledge gap that exists (Rabaa'i, 2009; Abugabah and Sanzogni, 2010; Thompson, Olugbara and Singh, 2018). Some authors argue that ERP system implementation challenges need to be carefully analyzed in developing countries context and not presume that achievement in one context will spontaneously equate victory in another (Trigo, Belfo and Estébanez, 2014; W Wamicha and Seymour, 2015). In this regard, there is insufficient study to identify CSFs for ERP system realization that endorses financial functions.

1.2. Research Problem and Aim

ERP systems are said to be a very essential corporate system delivering advantages for instance: maximizing corporate IT infrastructure the efficiency and effectiveness and aiding the incorporation of worldwide corporate processes (Al-Nafjan and Al-Mudimigh, 2011; Karande, Jain and Ghatule, 2012; Xu and Quaddus, 2013; Epizitone and Olugbara, 2019). However, W Wamicha and Seymour (2015), pointed out that there is a lack of copious competencies and expertise to execute implementation of ERP system and business process reengineering. Further studies have additionally contended the knowledge gap on ERP implementation exists in developing countries.

Belfo and Trigo (2013), revealed that despite ERP playing a huge attempt to integrate, ERP system does not support significant financial functions such as reporting, analyzing and budgeting. These are blatant for financial system where there is no current exploration to my knowledge on CSF of ERP implementation that endorses financial function hence, the necessity of this study.

The overarching aim is to identify "CSFs for ERP system implementation within a public HEI's financial information system with special attention paid to critical factors of ERP system that would support financial functions".

Attaining the aim, the ensuing predominant objectives are explored.

> Objective 1. To identify a minimal lot of critical factors for ERP enactment that aid financial function.

Objective 2. To explore the significance of each CSF in financial systems mediated by an efficacious implementation.

Objective 3. To investigate an effective model that when adopted would support financial functions.

Objective 4. To give general recommendation to management for the successful implementation of ERP Systems that support significant financial functions.

Thus, the above aim satisfying the above objectives answers the main research question which is additionally articulated to four research questions (RQ):

Foremost Research Question: "What are the critical success factors for ERP implementation to support financial functions?"

Research Question 1: "What is the minimum set of CSFs of ERP system implementation to support financial functions?"

Research Question 2: "What is the significance of each factor identify above in the financial system such as salary sub-system?"

Research Question 3: "How can these factors be structure into a comprehensive model to support financial functions?"

Research Question 4: "What recommendation can be made to management for a successful ERP implementation that would support financial functions?"

It is envisaged that upon realization of the aim of this research the results will serve as an endeavor to minimize implementation failure rate in HEI and contribute a solution to implementation problem in the developing world.

1.3. Study Background

According to Motiwala and Thompson (2012), the propagation of ERP system enactment lingers and persist at an expeditious trend with modern cohorts of systems cashing in on what has already been attained. Nevertheless, there are several issues currently experienced by countless corporations during and after enactment notably in HEI (Abugabah and Sanzogni, 2010; Garg, 2010; Belfo and Trigo, 2013; Mushavhanamadi and Mbohwa, 2013; Thompson, Olugbara and Singh, 2018; Epizitone and Olugbara, 2019).

“Research on the implementation of ERP system is said to be of utmost significance due to its influence on companies around the world that are undergoing major step in process involving ERP implementation” (Epizitone and Olugbara, 2019). An iterative course is immersed in the ERP system implementation life phase are upkeep and update (Nah and Delgado, 2006; Epizitone and Olugbara, 2019). Nonetheless, a sizable quantity of study done on CSFs of ERP systems concentrates mainly on a single enactment phase and deficient on the pre and post phase with the discoveries remaining recurring, erratic and needing empirical studies (Esteves and Pastor, 2000; Finney and Corbett, 2007; Hedman, 2010; Matende and Ogao, 2013; Ali and Miller, 2017; Epizitone and Olugbara, 2019).

Critical analysis of literature underlines the necessity for the vigorous disposition of CSFs to be meticulously reflected even if factors conversed in reports are hold vital as their significance fluctuates with time across stages and stakeholders life-cycle (Ahmad and Cuenca, 2013; Thompson, Olugbara and Singh, 2018). Finney and Corbett (2007) and Dawson and Owens (2008), reported this deficiency. While, Esteves and Pastor (2006), identified accomplishment benchmarks within a solo ERP system enactment phase. Yu (2005), reinforces the call for additional scrutiny as several corporations alter their schemes in the direction of enhancements or accumulations to already enacted ERPs. Amplifying this, Ram et al., (2013) and Ijaz *et al.* (2014a), argue the sizable disparities in accomplishment benchmarks for pre-enactment as divergent to post-enactment of the system. "Shaul and Tauber (2013), investigation on success criteria in ERP implementation unveiled a serious deficiency of literature on post implementation issues, strategies, and methods to address them" (Epizitone and Olugbara, 2019). These authors hail the need for more probe to scrutinize the realization criteria for different phases and chiefly distinct stages in the milieu of HEI (Rabaa'i, 2009; W Wamicha and Seymour, 2015).

"Literature also revealed other criticisms such as, studies being vendor specific and minimum focus on other vendor's product commission by HEI, CSF derived from methods that lack scientific rigour and the need for more innovative research techniques" (Epizitone and Olugbara, 2019). Several studies indicated that there are still issues in Africa that are not well analyzed in IS research while developed countries like North America and Europe have much done in their ICT and IS research (Ram, Corkindale and

Wu, 2013; Shaul and Tauber, 2013; Olugbara, Kalema and Kekwaletswe, 2014; W Wamicha and Seymour, 2015). Kalema *et al*., (2014), join these authors to decry the bulk of extant exploration for their predominantly theoretical literature-based assessment aiding the need for CSFs research that incorporates continuous technological development.

1.4. Methodology

The focus as set out is to determine CSFs for successful ERP systems enactment that aids financial functions. To achieve the research objectives quantitative and qualitative research method is utilised following three sequences. A combined approach of quantitative (Phase 1 and 2) and qualitative (phase 1 and phase 3) research method (Epizitone and Olugbara, 2020a).

Phase 1: Content Analysis

In this phase content obtained from extant literature review on CSFs for ERP systems are analysed with the intention to determine CSFs via the analysis technique of scope review. A systematic review is followed and it utilized search engines to obtain associated study papers to provided data vital for the next phase (Odunaike, Olugbara and Ojo, 2014; Olugbara, Kalema and Kekwaletswe, 2014; Epizitone and Olugbara, 2020a). The general knowledge learned from the literature help me determine CSFs that is contextualized in this research. In addition to the initial content analysis of literature, frequency analysis to extract a set of critical success factors is applied. The frequency analysis is based on the

unit of times that the factors are cited in the literature (Finney and Corbett, 2007). The factors are further deployed in the fieldwork.

Phase 2 Expert Validation of Critical Success Factors

At this phase for contexture relevance of the factors identify expert judgement is use to validate the identified CSFs. Soja (2006) and Ganesh and Mehta (2010), supports this method to be suitable in finding concrete information system CSFs. A minimum sample size of nine experts acceptable for this study is engaged which is within the range of expert panel estimated by (Worrell, Di Gangi and Bush, 2013; Olugbara, Kalema and Kekwaletswe, 2014; Campos Fernandes Leandro, Mexas and Drumond, 2017). These experts are selected from the various departments, ERP vendors and project management companies responsible for ERP implementation. Experts are the key role players which includes the head of departments, head of ERP implementations and long term users at the institutions (Parhizkar and Comuzzi, 2017; Thompson, Olugbara and Singh, 2018). An online survey is administered to the experts with the desire of the study being to derive those factors that are crucial for an efficacious ERP implementation that aids financial functions. A pragmatist philosophy is adhered to where factors are tested to establish their categories (Wahyuni 2012).

Phase 3 Determination of Cross Impact Matrix

The ADVIAN classification tool developed by Linss and Fried (2009) is a suitable impact analysis method for identifying key impact factors. The ADVIAN as opposed to other methods like Papiercomputer and MICMAC overcomes several limitations of the existing

cross impact analysis techniques (Thompson, Olugbara and Singh, 2018). The ADVIAN is a cross impact analysis methodology that organizes collected data in a matrix to show the interdependencies that data have on each other (Linss and Fried, 2010). The method can be used on its own or combined with other methodologies for a more robust cross impact analysis (Gordon, 1994). The method relies heavily on cross impact matrix (CIM) that must be determined for collating the qualitative view of experts. Hence, the application of ADVIAN in this study follows the expert input data collected that resulted in a tally of critical success factors indicating the degree of influence that each factor has on the others. Interpretation of the analysis will then result in a ranked list of critical success factors.

1.5. Thesis Structure

Chapter One: **Introduction** - present the research overview such as the background, impetuses, and objectives. This chapter serves mainly as the thesis introduction chapters.

Chapter Two: **Literature Review -** discuss the concepts involved in the study while defining the main problems experienced by the developing world concerning the adoption of ERP implementation in its context. It includes definitions, ERP's systems and CSF's main concepts and terms in the financial domains based on existing literature.

Chapter Three: **Research Methodology -** The approach, methods, and techniques used are presented in this chapter which also unpacking the research framework.

Data collection and discussion of the fieldwork phase is chapter Four: which described the processes and tools employed in the collection of data.

Chapter Five: **Research Findings -** present the analysis and present data collected for the study with the finding discussion from the analysis of data collected.

Chapter Six: **interpretation and discussion of ADVIAN results -** presented the determining the most CSFs from the ADVIAN results in this chapter. The interpretation and discussion in relation to the financial system

The final Chapter Seven: **summary, implications, limitations and conclusion** – introduces the research conclusion and affords endorsements on the ERP financial system future work. This included the conclusion, answering the research question, a discussion of the research conclusions, recommendations, precincts and possible imminent research opportunities.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

Chapter two is a discourse of the cogent concepts involved in the research while defining the main problems experienced by the developing world concerning the adoption of ERP implementation in its context. It includes definitions of ERP's systems and CSF's main concepts and terms in the financial domain based on existing literature.

2.2. Organization Enterprise System

The complex nature of business today has been the central motive for the evolution of ERP systems. A system that attempts to integrate information requirement and needs in an organization (Olugbara, Kalema and Kekwaletswe, 2014). Today's enterprise systems are designed to serve varied organizational needs making ERP systems a crucial component for a successful organization. They provide computerization of vast business roles namely accounting, finance, marketing, operation, human resource, and more. However, it has been reported in literature that significant financial functions such as reporting, analyzing and budgeting are not supported by these systems (Belfo and Trigo, 2013). Hence the aim of this study.

2.3. Information System

The role of information systems (IS) was always to enhance an organization by increasing its effectiveness and efficiency (Loonam *et al.*, 2018). From a fleeting historical synopsis of an IS, Loonam *et al.* (2018) highlight the need for organizations invariable information system to be more integrated. However, the expansion and changes in the business environment drive organizations to be reformed in order to gain competitive advantages (Chen *et al.*, 2012). While an organization's information system consists of computers, individuals, procedures and software for storage, organization and distribution of information it is difficult for organizations to operate and survive on a silo information system as the lack of a good information system can adversely impact an enterprise's efficiency especially when not integrated (ALdayel, Aldayel and Al-Mudimigh, 2011).

In this epoch as organizations grow there is also the need for their information systems to align with the changes in these systems, however, these phenomena only result in a wide variety of IS and computer architecture configuration which create a hodgepodge of independent IS. These independent systems need to be agile, flexible, responsive, streamlined, and integrated to align organization sustainability and profitability (Venkatraman and Fahd, 2016).

In the present day highly competitive environment success and efficiency of an organization are determined by how an organization can better integrate its activities from different IS (Alsoub, Alrawashdeh and Althunibat, 2018). As such integration offers improvement of communication and workflow in a business environment

creating a unified environment (Thompson, Olugbara and Singh, 2018). ERP system is a good example of an integrated IS.

2.4. Knowledge Management

Mahendrawathi (2015), defines knowledge management to be a process of creating values for business while generating a maintainable competitive gain with optimization on creating, communicating and knowledge application procedures desired to attain organizational aspirations. The main role of knowledge in the ERP enactment system process is to expedite knowledge distribution however, integrating internal and external knowledge is said to be difficult (Vandaie, 2008).

In literature, the initiative between ERP System and Knowledge management is said to be complementary rather than contradictory with authors reporting a balanced perspective that can assist an organization share different knowledge (Ke and Wei, 2008; Mahendrawathi, 2015). The importance of knowledge management has been acknowledged in literature as a significant aspect to be accounted for in order to implement ERP system successfully (Rabaa'i, 2009).

2.5. ERP System

ERP systems consist of a medial cutting-edge comprehensive database that amasses, hoards, disseminates data athwart the complete corporate roles and doings in an organization (Supramaniam and Kuppusamy, 2010). According to Frimpon (2011), ERP systems employed the use of a central database that pulls data to and fro into an

application module operating on a mutual computer platform. Asserted by Maheshwari, Singh and Tripathi (2011), ERP is considered to be a cohesive computer base planning technique used for management and resource planning in an organization.

ERP as an integrated software program that combines functions and departments across an organization into a solo computer system which serve up the demands of unharmonious departments (Frimpon, 2011). Frimpon (2011), reports ERP to be a single unified software program divided into different module which provides a unified environment that obliterates standalone systems in an organization.

2.5.1. Modular Construction

The different modules are dedicated to specific business processes for instance finance and accounting, human resource, procurement, marketing and sales (ALdayel, Aldayel and Al-Mudimigh, 2011). The ERP systems modular design has been widely accepted in many organizations seeking to employ only the use of a particular module. Thereby saving the cost of implementing an entire system without compromising the system main functionality of integrating business functions (Upadhyay and Dan, 2008). Figure 1 presents the basic module functionality of ERP system in HIEs commonly known as Integrated Tertiary Software (ITS).

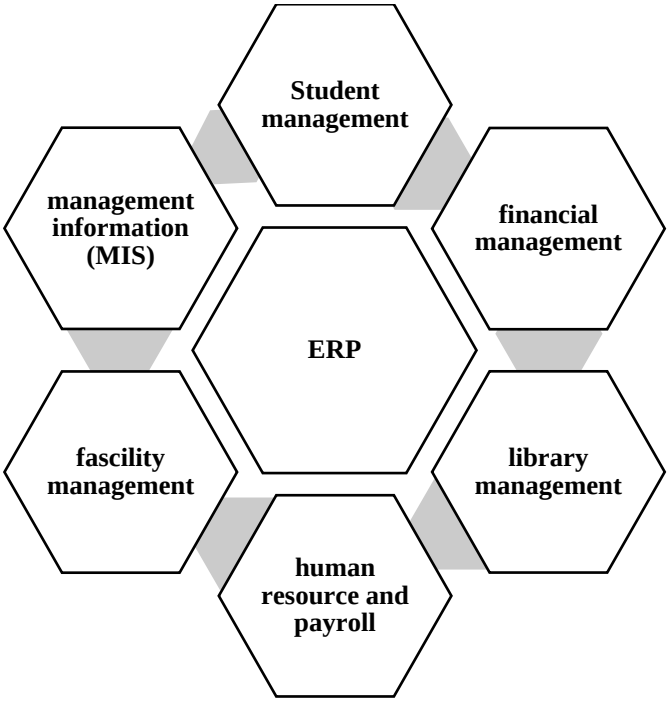


Figure 2-1. Basic module functionality of ERP system in HEIs

2.5.2 ERP System and Business Process

Organizations and businesses contain functional areas of operation characterize by unique and specific functions. These functional areas of operations are broad classifications of business activities. Collectively these business activities are referred to as business processes (BP). Initially, this system was developed to support common organizational functions (Bhat, Shroff and Bandi, 2013). The four most common basic functions are marketing and sales (MIS), Supply chain management (SCM), Human resource (HR) and accounting and finance (A/F). Although these functions are completely unique and specific, they are interdependent on each other requiring and sharing data.

Process-oriented business view and business process standardization are achieved across an organization in an ERP environment (Loonam *et al.*, 2018). These business

processes are routinely crossing functional areas highlighting the need for integration. ERP is asserted by Shaul and Tauber (2013) to be a system that allows seamless integration. Acting as a technological hub within an organization that allows data from different business functions to be manipulated and processed. According to Loonam *et al.* (2018), a more seamless and integrated working environment has been the focus and pursuit sort out by invariable information system and organization.

2.6. ERP SYSTEM IMPLEMENTATION

In the last decade, ERP implementation has been one of the most pervasive change activities in an organization (Bhat, Shroff and Bandi, 2013). Implementation of this system is an on-going process that follows a phase life cycle explicitly pre-implementation, implementation and post-implementation (Ijaz *et al.*, 2014b; Shatat, 2015). There are also stages that have been identified across this lifecycle by various researchers which include but not limited to planning, designing, development, testing, analysis, construction and deployment (Chofreh, Goni and Klemeš, 2017).

According to Dantes and Hasibuan (2011), there are many stages and components involved in ERP implementation that must be performed while incorporating critical success factors with implementation methodologies and models. Such phase consists of project planning, selection of technology, project design, enactment/development and post-implementations. While the constituents involve Organization/people, procedure, application, data and infrastructure (Dantes and Hasibuan, 2011).

Despite these phases and stages identify cited in extant literature on ERP systems implementation, standardization seems to be a challenge in literature resulting in

authors seeking to developed roadmaps, frameworks and guidelines that assist practitioners and companies with implementation (Al-Hinai, Edwards and Humphries, 2013).

One such study pioneered by Chofreh, Goni and Klemeš (2017) shifts the focus from just enacting an ERP system to implementing a sustainable ERP system. Through extensive literature review, Chofreh, Goni and Klemeš (2017) incorporate a conceptual research methodology with project management concept to develop a roadmap advantageous to practitioners the diverse phases and stages of a sustainable ERP system implementation.

Although researchers and empirics present several implementation models in academic literature none focus on sustaining ERP implementation. Therefore it is probable to settle that the model offered by Chofreh, Goni and Klemeš (2017) is the most detailed and viable as it focuses on the sustainability of ERP implementation (Figure 2.2).

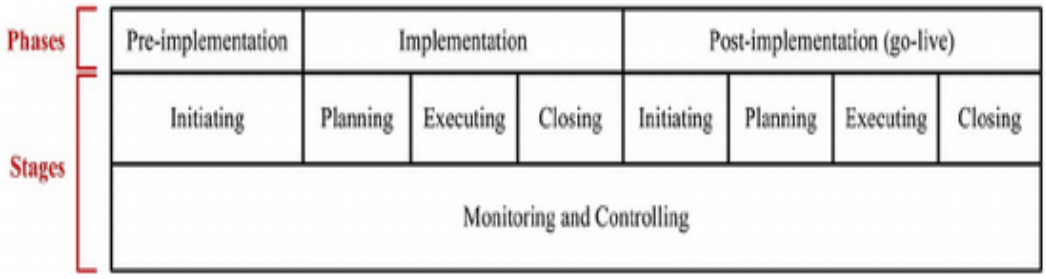


Figure 2- 2 Phases and stages of ERP system Implementation Chofreh, Goni and Klemeš 2017)

2.6.1. Implementation disputes

Although ERP implementation has been posited by authors to provide seamless integration, many studies contend that there have been significant challenges encountered in implementations (Bhat, Shroff and Bandi, 2013; Shaul and Tauber, 2013; Shatat, 2015; Loonam *et al.*, 2018) 2.6.1.1. Long-term and Costly studies report that ERP implementation is considered to be costly and a long-term process requiring the engrossment of extensive resource with people being given preference (Rabaa'i, 2009; Frimpon, 2011; Pecherskaya *et al.*, 2015; Alsoub, Alrawashdeh and Althunibat, 2018).

2.6.1.2 High reported failure

Numerous academic research on ERP systems implementation details a soaring number of failures especially in the higher education sector (Dawson and Owens, 2008; Abugabah and Sanzogni, 2010; Shaul and Tauber, 2013; Thompson, Olugbara and Singh, 2018) According to Pecherskaya *et al.* (2015) implementation of ERP system unavoidably triggers a change process in an organization which is attributed to the high failure rates.

2.6.1.3 Complexity of ERP systems

The complex nature of ERP systems makes implementation complicated in regards to the realization (Upadhyay and Dan, 2008; Pecherskaya *et al.*, 2015) given that it takes between 1- 5 years to reap expected benefits. This was further supported by Bhat, Shroff and Bandi (2013) in their study which highlighted the need to defined explicit data related policies during implementation with the focus being placed on the end-

user function in the implementation accomplishment. Via a qualitative case study, they found that initial expectation for ERP system implementation are not met does create a perception of ERP being a useless system.

2.6.1.4 Other defiance

Several studies also identify and summarize other ERP implementation challenges but not limited to user resistance, variations in job content, alter relational associations, loss of authority, loss of status, alteration in decision making approach, ambiguity, unusualness, distortion of information, system alignment and job uncertainty (Abugabah and Sanzogni, 2010; Chen *et al.*, 2012; Bhat, Shroff and Bandi, 2013; Pecherskaya *et al.*, 2015)

2.6.2. Evolution of ERP system implementation

Introduce in 1990 by the Gartner Group, a consultancy firm based in the US as a new concept in business programming (Supramaniam and Kuppusamy, 2010; Frimpon, 2011). ERP system date back to the 1960s, when it was an inventory management system. Over time these systems have progressed from "Materials Requirements Planning" (MPR) in the 1970s. In the 1980s the "Manufacturing Resource Planning" (MRP II), ERP in the 1990s, Upgraded to ERP II in the 2000s to "Sustainable Enterprise Resource planning" (S-ERP) in 2018. Currently, moving toward the "Intelligent Enterprise Resource planning" in the wake of the fourth industrial revolution (4^{th} IR).

As ERP system develops there has been an evolution in their intended purposes and term. Primarily introduce as an integrated software application in the 1960s and later

embrace as an integrated information system in the 2000s (Supramaniam and Kuppusamy, 2010). Today, not only is ERP implemented globally in diverse organization it is also moving toward sustainability goal as a sustainable integrated information system in 2018 (Chofreh, Goni and Klemeš, 2017, 2018). Despite these evolutions, ERP is still considered to be in a nascent phase (Abugabah and Sanzogni, 2010; Frimpon, 2011). Table 2 1 present the fruition of ERP system adaptation from the 60s to the present time.

Table 2-1. Source: Adapted and modified from Supramaniam and Kuppusamy (2010)

Period	Evolution	Term and Purposes
1960	"Inventory control Packages"	Integrated software application
1970	"Materials Requirements Planning" (MPR)	
1980	"Manufacturing Resource Planning" (MRP II)	
1990	"Enterprise Resource Planning" (ERP)	
2000	"Extended Enterprise Resource Planning" (ERP II)	Integrated information system

2018	“Sustainable Enterprise Resource planning” (S-ERP)	Sustainable integrated information system
2020	“Intelligent Enterprise Resource planning” (I-EPR)	Intelligent Enterprise Resource planning

2.6.3. HIE Espousal of ERP System

Despite the many challenges and barriers encountered by ERP implementation in an organization, ERP systems are considered to be the most momentous event in the expanse of corporate technology emerging today as an extremely important business component of modern business process (Pecherskaya *et al.*, 2015). Karande, Jain and Ghatule (2012), posit the concept of commerce coupled with modernization to be a gigantic force in the education sector that has attracted global spotlight mainly due to the evolution of the education system.

Many studies define ERP systems for universities to be a technological solution that automates and integrates functions such as but not limited to recruiting, admission, financial aid, student records, student application forms, student application forms, fee processing, course enrolment, course management, asset management, salaries processing, alumni management, research networks and most academic and

administrative services (ALdayel, Aldayel and Al-Mudimigh, 2011; Frimpon, 2011; Bhat, Shroff and Bandi, 2013; Thompson, Olugbara and Singh, 2018). According to Frimpon (2011), academic and administrative functions are the two main functions in a university and the core reasons why ERP is being adapted is to provide commercial solutions to these functions. Rabaa'i (2009), further in his study indicated the main reason for implementation in HIEs to be mainly to integrate diverse administrative tasks to a more cost-effective and systematic approach as a means to obtain strategic benefit.

Other motivation cited in literature includes, but not limited to global trends, increase student number, competitive education environment, gain competitive and strategic advantages, quality and performance requirement, replacement of legacy systems, organization restructuring and process and interaction improvement (Rabaa'i, 2009; ALdayel, Aldayel and Al-Mudimigh, 2011; Ghuman and Chaudhary, 2012; Thompson, Olugbara and Singh, 2018)

According to Tortorella and Fries (2015)' study aims at pinpointing the rationales for ERP systems adoption in a public HEI. They classify four perspectives namely: integration, process, decision making and complexity. Among these categories, Tortorella and Fries (2015), jettisoned that integration is the fundamental need for adoption in public universities as oppose to other HEIs due to their high diversity and complex nature. Their study organized reasons public HEI adopt ERP systems into four categories namely: integration, processes, decision-making and complexity. A detailed table can be seen below adopted from Tortorella and Fries (2015) with the reasons, categories and definition given.

Perspective	Reason	Definition
Integration	Flow of consistent information	Quality information, redundancy reduction; source of information and access available in a single (or reduced potential sites) site and in real time.
	Horizontal viewing	Process view: beginning to end, perception of the impact of other departments activities and in the academic community in general.
	IS integration	Modernizing systems; multiple interfaces reduction
	Communication between departments	(Mainly) Among academic departments aiming at better teaching contribution.
Processes	Standardization and knowledge management	Homogeneous activities; cognitive work change; knowledge availability (as opposed to retention).
	Automation and agility	Task runtime reduction, repetitive routines especially in cases involving bureaucracy, increased productivity; reduction of physical files (paper).
	Reduced operating costs and increased efficiency	Leaner and more efficient processes, reducing the number of operating staff.
	Server motivation	Increased time spent in activities that add value to the academic community.
Decision-making	Analytical skills	Refers to multiple sources of information and consolidation of reports.
Complexity	Diversity	Multiplicity of interest variables: departments, students, courses.
	Organizational departmentalization	Structure type that hinders communication and increases complexity.
	Academic freedom	University policy of freedom on the academic management by teachers.
	Changes	Emergence of new courses, selection processes, educational and administrative departments.

Figure 2- 3 A table of reasons for ERP adoption in a public HEI adopted from Tortorella and Fries (2015)

2.7. Challenges

Implementing ERP in organizations in the corporate segment and in HEI have been discussed in a great extent in literature with authors postulating that both organizations share the same reason for adoption (Moon, 2007; ALdayel, Aldayel and Al-Mudimigh, 2011). However, implementation in HEI receives inimitable sets of challenges and requirements curtailing from the differ sets of administrative and academic functionality of the system (Rabaa'i, 2009; Bhat, Shroff and Bandi, 2013).

Frimpon (2011), study reveals that some of these challenges include:

- Exertion in retrieving information from paper files.
- Indecorous way of trading information amongst different departments.
- A paucity of interconnection among departments.
- Hurdle in preserving student and staff record up to date and error free.
- Low productivity because of wastage of hours by staff resulting from manual processes such as capturing information, performance of administrative tasks like results and evaluation generation.
- Unavailability of precision in maintaining financial records such as fee, expenses and salary.
- Deficiency of automation in determining fee balances, finding fee defaulters, and staff salary computation.
- Lack of a quick and easy means of accessing old records.
- Over-time spent in generating timetable and allocating adjuncts by administrators.
- A paucity of way to offer employers and benefactors rapid access to student records.
- Lack of knowledge of new IS potential that create multiple synergies and benefits to the institution.
- Lack of resources namely access, skills and dynamic competencies to produce quantifiable output from these systems.

2.7.1 Failure and Menace Leeway

ERP implementation in HEI is a risky and lengthy process with a high probability of failure. Literature reveals these to be ascribed to two main factors the cost of implementation and the system complexity (Frimpon, 2011; Ram, Corkindale and Wu, 2013; Olugbara, Kalema and Kekwaletswe, 2014; Thompson, Olugbara and Singh, 2018).

Despite having many possible attributes to the ERP implementation process yet in literature it has been referred to as a challenging undertaking that emanates with monkey wrench embedded in it due to the risks of cost, overrun schedule and appalling low-success rate figures (Rabaa'i, 2009; Frimpon, 2011; Loonam *et al.*, 2018). Studies on ERP implementation presuppose the high failure probability to be directly linked to the complexity of the system with high failure associated with HIE (Thompson, Olugbara and Singh, 2018). There have been many reported let-down in empirical and case studies (Abugabah and Sanzogni, 2010; ALdayel, Aldayel and Al-Mudimigh, 2011; Maheshwari, Singh and Tripathi, 2011; Loonam *et al.*, 2018; Thompson, Olugbara and Singh, 2018).

2.8. ERP SYSTEMS BENEFITS

The paybacks of successfully enacting an ERP system is asserted in literature to be very gratifying in spite of the risks of executing being unnerving (Frimpon, 2011; Thompson, Olugbara and Singh, 2018). Rabaa'i (2009), report ERP implementation in HIEs to be a belief in solution despite being described as difficult, expensive and risky. ERP system benefits in literature cover a wide range of categories from

intangible to tangible to functional benefits. Frimpon (2011), report the following benefits:

- Augment access to timely and accurate information,
- Augment workflow,
- Increase proficiency,
- Slash dependence on paper,
- Heightened automated email alerts and controls,
- User-approachable web-based interfaces,
- Streamline procedures,
- Ease of adoption of finest commercial practices,
- Established reinforcement for novel system integrates with prevailing systems,
- A roll-out ERP system obliterating old stand-alone system with different IS.

One More study by Loonam *et al.* (2018) recounted the gains of ERP along with the challenges as the major reason for ERP implementation as follow:

- Increase corporate data visibility,
- Generate novel and advance current business processes,
- Expand responsiveness to customers,
- Standardise computer platform,
- Upsurge flexibility,
- Facilitate information sharing globally,
- Advances performance of the business,
- Financial benefits such as inventory reduction, logistics, materials management and sourcing,

- Reduction of cost and increase organisation performance,
- Economic of scales and operation cost reduction.

Rabaa'i (2009), focusing on ERP system in HEIs listed 4 main benefits:

- Improve ingress to information intended for institution managing and planning,
- Ameliorate student, faculty and employees services,
- Decreases business threats,
- Upsurge income and cut expenses due to improved efficiency.

2.9. CSFs of ERP System

In literature, there have been calls for a sound comprehension of CSFs prompted by the huge failure rates and difficulties encountered in implementing this system in the university environment (Rabaa'i, 2009). These calls have been discoursed by authors researching the concept of CSFs to tackle implementation challenges. The concept of CSFs was instituted by Daniel in 1961 and popularised by Rochart in 1979 (Loonam *et al.*, 2018). The CSFs concept has been implemented in vary environments such as management sciences, software management, public-private partnership and marketing and retail projects (Thompson, Olugbara and Singh, 2018). According to Finney and Corbett (2007), Richard views CSFs as those unambiguously illustrious sections that establishments need to "get right" in other for a corporation to compete efficaciously.

In the ERP's context, CSFs have been defined as a bung of activities that warrants continual attention with unusual considerations for ERP system planning and enactment (Rabaa'i, 2009). Finney and Corbett (2007), posit that with regards to ERP

implementation for the process to be successful there are certain conditions that must be met refer to as CSFs. Studies on CSFs approach has received a lot of criticism however, authors have argues that they are indispensable for any project attainment (Almarri and Boussabaine, 2017; Thompson, Olugbara and Singh, 2018).

The study of CSFs impacting ERP implementation has been examined by authors in different dimensions which are not limited to sociological, technological, tactical, organisational and strategically (Shaul and Tauber, 2010; Dantes and Hasibuan, 2011; Karande, Jain and Ghatule, 2012; Shaul and Tauber, 2012, 2013; Olugbara, Kalema and Kekwaletswe, 2014). figure 4 shows summarise CSF dimensions.

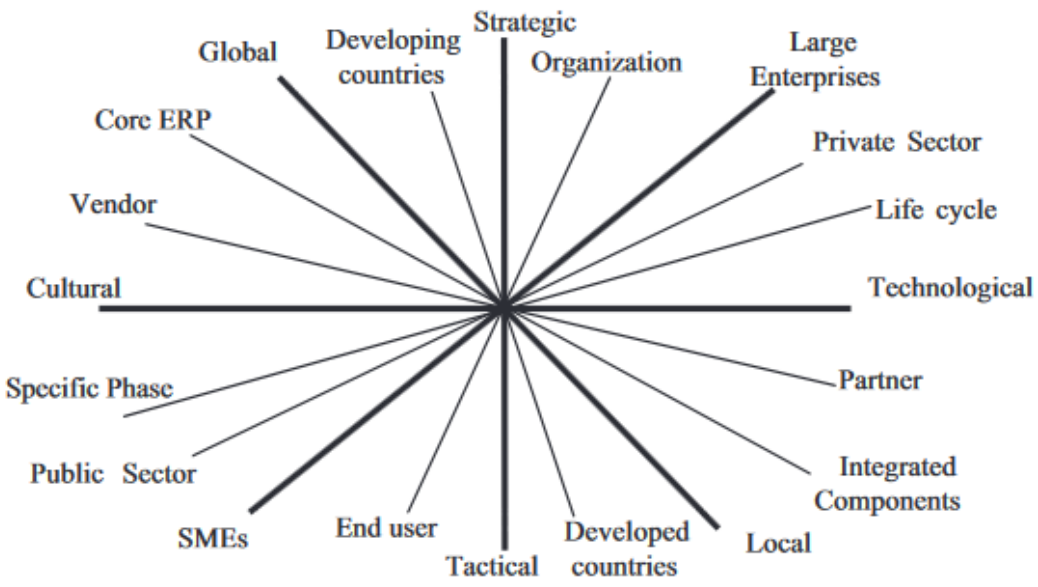


Figure 2- 4 Source: Figure adapted from Shaul and Tauber (2013)

Over the past decades, there have been a plethora of ERP CSFs studies that have subsidized the grasp of CSFs (Loonam *et al.*, 2018). However, within extant literature, CSFs remains case-based and anecdotal with authors calling for a more rigorous

scientific method (Olugbara, Kalema and Kekwaletswe, 2014; Thompson, Olugbara and Singh, 2018; Epizitone and Olugbara, 2019). Several authors have retorted this call espousing CSFs to underline areas that are vital for ERP enactment accomplishment (Loonam *et al.*, 2018). According to Loonam *et al.* (2018), CSFs are an influential enabler widely established in ERP reports as a key organizational issues' ascertainment needing attention before and in the course of ERP implementation. Shatat (2015), emphasized the importance of CSFs involvement for the duration of implementation to expedite the unremitting accomplishment of the ERP system that ensure an enhanced impact on corporate performance.

Thompson, Olugbara and Singh (2018), present a scientific classification of CSFs in HEIs identifying 12 CSFs from 20 selected CSFs using ADVIAN to rank factors investigated using the preference list approach after reviewing 38 articles.

Olugbara, Kalema and Kekwaletswe (2014) through the analysis technique of scope review followed by a systematic review step identified 43 factors which as latter narrow down to 37 using cross impact analysis adopted from García, Rivera and Iniesta (2013) technique. Their study determines the bearing of a factor on another with the input of specialist judgement.

Ram, Corkindale and Wu (2013), involved employed the "structural equation modelling (SEM) technique" to determine the affiliation of CSFs flanked by enactment accomplishment and post-implementation performance after exploring 217 organization and discussing four chosen CSFs.

Loonam *et al.* (2018), from cross-analysis of 20 studies found 34 CSFs from literature that aid academics and practitioners with an all-inclusive insight of ERP implementation.

Supramaniam and Kuppusamy (2010), using responses from 151 firms identified 22 CSFs and investigated their importance grouping them into three categories namely "knowledge management, business process and requirement study and project and communication management".

Dezdar and Sulaiman (2009), presented 17 CSFs using the frequency count method to analyze 95 articles over a period of 10years ranging from 1999 to 2009

Shaul and Tauber (2010), hypothesize that 94 reviewed CSFs grouped overall and across individual phase of ERP's life cycle using statistical extraction method to produce several extracted constructs.

ALdayel, Aldayel and Al-Mudimigh (2011), explore and analyze a case study in HEIs to measure ERP's system success from a technical and user angle. They presented 18 CSFs highlighting project management to be the most important factor.

Frimpon (2011), presented 28 identified CSFs of ERP implementation system in HEIs which was classified into five groupings using pairwise comparisons to measure the interactions and concomitantly of complexity.

Karande, Jain and Ghatule (2012), presented 13 CSFs for any educational system classify as strategic, tactical and operational. Rabaa'i (2009), identified 12 CSFs using frequency analysis and presented contextual details regarding ERP implementation and evaluation in HEIs in the Australasian region.

Shatat (2015), study 20 CSFs identified from literature and concluded that 10 CSFs should be considered during implementation as the most important factors. Their study contends that these 10 CSFs can help firms accomplished a successful implementation of ERP systems.

Dantes and Hasibuan (2011), discusses ERP enactment outline based on vital success factors another term for CSFs classify identify 15 factors from literature into 3 sorts namely: people, organization/procedure and technology.

Al-Hinai, Edwards and Humphries (2013), using frequency of occurrence to identify 61 CSFs from literature deem to be important with their relevance varying across ERP life-cycle stages and stakeholders.

Ngai, Law and Wat (2008), discusses 18 CSFs selected out 92 CSFs identified through a comprehensive and systematic literature review from across various countries.

Campos Fernandes Leandro, Mexas and Drumond (2017), through literature review, identified 30 FCS in ERP implementation. Among which, “20 nominated for the assessment and then congregated to five sorts: “ERP Organization, ERP Project, ERP Software, ERP User and ERP Expertise”.

Soliman and Karia (2017), discuss a moderately trivial proportion of CSFs within ERP adoption among HEI highlighting their importance while providing a better understanding of whether their roles are restricted to manipulating the result of the pertinent leg in an innovation course or their aptitude to effect the competitive advantage.

Reitsma and Hilletofth (2018b), highlight the vital role of users throughout ERP system implementation discussing and evaluating “13 CSFs for ERP system implementation derived from the literature from a user perspective”.

Sowan, Tahboub and Khamayseh (2017), concerted on practical success factors influences on and importance to a successful ERP system enactment. Identifying 10 CSFs designating the value of CSFs that should endorse the formation that desires to be tailed during enactment to generally conform to achieve a successful ERP system.

2.10. Study Conceptualization

The hefty gauge of disintegration in HEIs (Rabaa'i, 2009) has cause countless Institution to seek a unified platform such as ERP systems that can integrate its systems. Yet, the enactment of these ERP systems remains mal with numerous trials as mention above. In the instance of financial functions, there are rumors these systems dally in real-time and unsupportive of foremost events such as reporting (Trigo, Belfo and Estébanez, 2014; Noaman and Ahmed, 2015). The modular design of ERP furnishes for distinct organizational processes however each one of these modules that are not financial incline regularly correlates with the financial module. This module delivers and demands information from the financial modules for facets not limited to reports, budgets, salaries and fee.” This concern and reality is echo by Noaman and Ahmed (2015) that highlight the shortage of vendors solicitous the higher education ERP real functionalities.

2.10.1. ERP financial system

"The financial subsystem of ERP has been the focal point where industry sectors of enterprises have consistently given careful consideration at all time when endorsing ERP systems since financial management that targets capital flow emulates an entity' corporate recital and proficiency" (Epizitone and Olugbara, 2019). ERP system has financial management continuously hauled as a prime unit or module that other feeds information or afford services to others. In spite of ERP systems enactment being confined by sundry establishments expressly in HEI for motives like reformation, globalization, informatization and modernization, there have been consummate prospects and challenges (Epizitone and Olugbara, 2019). Studies details obstacles and disputes uncovered throughout the enactment of ERP financial system as fragments of the holistic ERP namely:

- Inherent core financial systems' functions,
- Amalgamation of financial systems,
- Scarcity of contemporary scientific techniques of assistance,
- Relentless fluctuations in the organization interior and peripheral topology.

2.10.2. Unrealized functions of financial systems

Financial Functions of the ERP financial system can range from; "account processing, financial report generation, financial report integration, management, cost management, payroll processing, fixed assets management, financial analysis, decision support, internal fund management, inventory control, purchasing management, sales management" (Zhu, 2006). These functions incorporate financial,

management and cost accounting as a unit while synthesizing advanced output of planning, control and decision making.

While these financial functions are separated, they are also related to different users of these system using these functions differently. There is a methodical rapport residing in internal data of a function which symbolize the value flow interrelation such as money and material. In spite of these, certain functions are not utterly achieved as predicted.

Financial regulations are also a concern with the ERP financial system function as these regulations are constantly under review and regulated both nationally and internationally making functions of this module not to be duly utilized.

Everyday functions such as accounts, statements, cost control, reports and forecasting have various difficulties as such enterprise fail to realize these functions as yet.

2.10.3. Integration issues

The topmost goal of ERP implementation with the financial subsystem being the most significant is to manage information that could enhance organizational competitiveness. While integration is the key enabler of the benefits associated with ERP system implementation, modules can be operated while not wholly integrated. In most financial subsystems value flow cannot be pragmatic and control in line with information and material stream resulting to delay in some or most financial information delivery on a real time basis which is a vicious cycle.

To conclude financial functions relative to ERP systems implementation clearly indicate the necessity for an ERP system to supports financial function is apparent and

vital for an organization when aiming to achieve differentiation and competitive advantage as a well-functioning successful implemented ERP system. Successfully implementing ERP systems does not only offer the above benefits to an organization but will also increase the organization performance and effectiveness while aligning to their strategic management. While comprehending and implementing the system is most essential, however, it is also relevant from this standpoint as it can be seen from above that understanding and taking into consideration what makes ERP implementation successful is highly pertinent as a fail system impact financial functions and integration. Hence the demand for CSFs of ERP implementation study that benefits financial function is paramount.

2.11. Chapter Summary

A comprehensive background laying out the theoretical and conceptual context of the investigation of CSFs for ERP system as pertaining to HEI and Financial system. Relevant publications were reviewed and presented with the highlighted gap that motivates the development of this study to tackle ERP challenges. The subsequent chapter explains the methodological framework adopted to realize this research.

CHAPTER THREE

METHODOLOGY

The entire methodology was published as: “Mixed method approach to determination of critical success factors for successful financial ERP system implementation,” in the DHET Accredited Journals - SCOPUS *Academy of Accounting and Financial Studies Journal*, vol. 24, no. 2, pp. 1-10, (2020) and structured in the thesis. (Epizitone, and Olugbara, 2020a).

3.1. Introduction

This thesis aims to identify the CSFs for ERP systems’ enactment and to establish a distinctive lot of CSFs for higher education institution (HEI) that aid financial functions. A joint approach was adopted to attain the objectives of this thesis. This encompasses three sequences that incorporate the method broadly. In phase one and two a quantitative method is applied and subsequently, in phase one and three a qualitative approach is employed. Succeeding research questions and objectives were formulated are addressed via this approach:

Foremost Research Questions: “What are the critical success factors for ERP implementation to support financial functions?”

Research Question 1: “What is the minimum set of CSFs of ERP system implementation to support financial functions?”

Research Question 2: “What is the significance of each factor identified above in the financial system such as salary sub-system?”

Research Question 3: “How can these factors be structured into a comprehensive model to support financial functions?”

Research Question 4: “What recommendation can be made to management for a successful ERP implementation that would support financial functions?”

To accomplish the aforementioned questions, chapter three emphasizes on the thesis research methodology steps via the associated ERP systems, CSFs, HEIs and the thesis discourse. In Figure 3.1, the proposed methodological schemes required to attain the abovementioned aim and objectives. A pragmatist philosophy is adhered to, and erudite investigation validations incorporating experts’ panel opinion jointly conversed. Additionally, the choice, insertion and elimination basis of the literature and experts used is detailed.

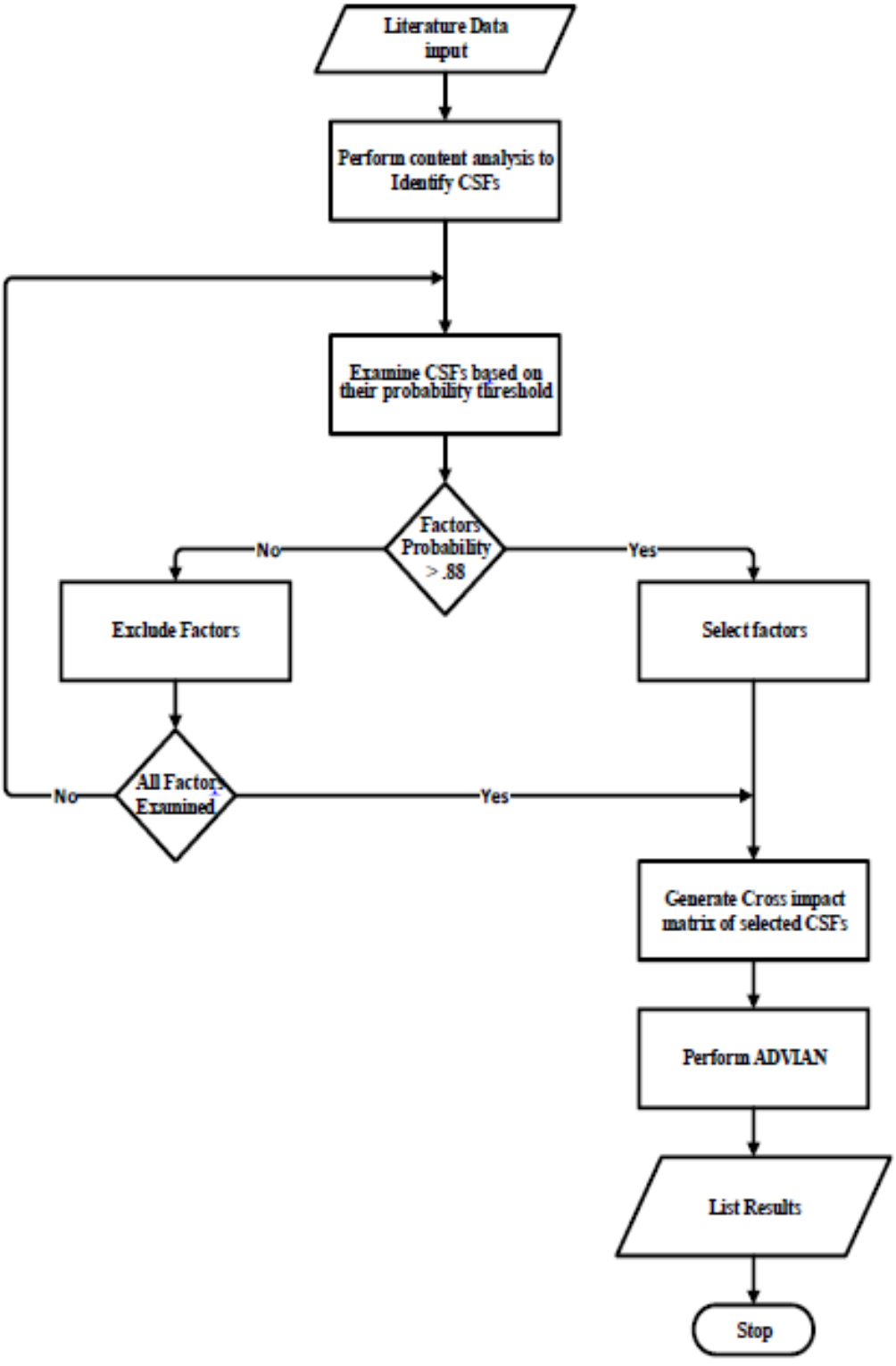


Figure 3- 1 Proposed Framework for CSFs determination

3.2. Study Philosophy

““The system of belief and assumptions regarding knowledge development refers to the research philosophy” (Epizitone and Olugbara, 2020a). It is purported by Saunders *et al.* (2009) to be a product of a relentless and judicious lot of presuppositions reinforcing the investigation process, data collection techniques, research questions and methodological choice of the scholar. Saunders *et al.* (2009) and Iofrida *et al.* (2018a) opinionate that the rudimentary philosophy reflects and directs the academic. Further indicating the process and methodological choices are grounded on scientific paradigm (Epizitone and Olugbara, 2020a). Epizitone and Olugbara, (2020a) report the connotation of paradigm to indicate a customary lot of essential theoretic views, norms and methodology techniques converse in usual science by the scientific society (Jonker and Pennink, 2010; Iofrida *et al.* 2018b).

Philosophy of science and functions of the dissimilar study paradigm delineates vast paradigm elements (Epizitone and Olugbara, 2020a). Authors (Mackenzie and Knipe, 2006b; Wahyuni, 2012; Iofrida *et al.*, 2018b) segregate these elements: ontology, epistemology, axiology and methodology. “Ontology is the investigator conception about the nature of reality, epistemology is the relationship between the knower and what is being studied, axiology is the role of values in research and the researcher’s stance and methodology as to how researchers can find out knowledge” (Epizitone and Olugbara, 2020a).

The study aim and objectives determine the appropriate philosophy to be utilized. “The four philosophies are positivism, post-positivism, interpretivism and pragmatism”

(Epizitone and Olugbara, 2020a). Positivism counts on apparent occurrence to afford trustworthy data with actualities and concentrating on causality and statute simplifications to shrink occurrences to most naive rudiments (Saunders *et al.*, 2009; Wahyuni, 2012). Post-positivism similar to positivism however substituting it to be a critical realism center on expounding the context and segregating the occurrence of an objective from belief (Wahyuni, 2012: Epizitone and Olugbara, 2020a). "Interpretivism is based on belief, and meaning the simple phenomena are appropriate for every research issue as the real essence of reality cannot be known" (Epizitone and Olugbara, 2020a). Interpretivism-oriented incorporating constructivism and interpretivism is genuineness constructed or interpreted via acuity (Iofrida *et al.*, 2018b). Lastly, pragmatism argues that there are no predetermined outlines or theories shaping truth implying it is not devoted to any solo system or reality or philosophy (Mackenzie and Knipe, 2006b; Saunders *et al.*, 2009). This is the underpinning philosophy for mixed method that guides this study (Epizitone and Olugbara, 2020a). Author posit pragmatism to be best suited for research undertakings since philosophy is continuously opposing lone stances that construct knowledge from nothing (Saunders *et al.*, 2009; Wahyuni, 2012).

"The philosophy adopted for this study was pragmatism as it helps the researcher to perform this study using mixed methods with the purpose of this study to afford acceptable new knowledge reliant on the research demand while focusing on explaining within the context of financial systems. Since the aim is to research CSFs for ERP system establishment from a financial system standpoint a slant different from previous studies observable phenomena and subjective meaning will be considered providing credible data and fact" (Epizitone and Olugbara, 2020a). Conducting this

research is in a “value-bond and etic-emic”. The tenets remarkable function in construing the outcomes resulting from espousing a combined objective and subjective stance to produce untainted knowledge.

3.3. Research Nature

“The nature of this research affords a track that leads the study in a systematized manner toward the achievement of the research objective. The nature of the study could be either one or a combination of two or more of the various strategies which is exploratory, explanatory and descriptive (Saunders *et al.*, 2009; Kumar, 2019). Since this study uses elements of the pragmatism philosophy and paradigm it indicates the purpose of this research study may well be descriptive, explanatory and or exploratory.

An explanatory research study strategy seeks to develop an accurate theory which could be adopted to describe practical generalization. While the study of a descriptive nature seeks to answer the questions that likely start with; who, what, where, when and or how of the research study topic and questions. Moreover, with the aim to identify critical success factors for ERP system implementation with special attention paid to ERP financial subsystem which involves elucidating and investigating this extent will require an exploratory strategy that aims to build new knowledge (Ahmad, Haleem and Syed, 2012; Hentschel, Leyh and Baumhauer, 2019).

Exploratory study is adopted when the research study seeks to find out about the topic of interest what is happening, to ask questions and evaluate findings from different perspective. To determine the CSFs for ERP system with respect to financial system knowledge will be extended to existing knowledge. Hence, to be able to do that an

extensive review of literature to adapt it towards the financial system was required, which indicate that the study was descriptive of nature as well. Nonetheless, the research study intended to deliver valuable insight from a financial perspective with the objective CSFs in hand through an ERP system implementation. Henceforth, this research nature combines both descriptive and exploratory strategy leading to the research nature being descriptor-exploratory (Saunders *et al.*, 2009; Nabee and Walters, 2018)."

3.4. Research Approach

"Tactics and actions for a research study are referred to as research approach (Crowther and Lancaster, 2009). Three approaches cited in literature to research study are deductive approach, inductive approach and abductive approach (Saunders *et al.*, 2009; Åsvoll, 2014). Abductive approach is the first stage of all interpretative processes and any scientific investigation.

Abductive approach infers beholding for and discovering potential explanatory arrays within the facts of a phenomenon to divulge a track from facts to ideas and theory or articulated differently basically it strives for theory. This approach can further new and useful hypotheses (Åsvoll, 2014).

Deductive on the other hand "is based on theory or, more specifically, the theory's hypotheses". It is conceivable to trial and categorize the empirical actualities with this approach in a more methodical and precarious way than abductive concerns. However, deductive approach is incapable of affording new "hypotheses or assumptions" since

it is preliminarily “self-referring”, explaining the relationship between variables as to test a theory (Saunders *et al.*, 2009; Åsvoll, 2014).

In inductive approach, a new theory is formed base on research observation and empirical data from qualitative methods. (Mertens, 2008; Saunders *et al.*, 2009).

The research approach adopted is the abductive approach as it best suites that research philosophy of pragmatism as it moves to and from and in essence combining both deductive; that is required at the beginning of any scientific research and inductive; that explore past studies from disparate perspectives (Crowther and Lancaster, 2009; Saunders *et al.*, 2009; Åsvoll, 2014). Furthermore, with regards to methodology of pragmatism, there are sturdy epistemological precincts tied to inductions in “interpretative qualitative methodology”. Although the present study seeks to explore CSFs that have already been discussed from different perspectives new knowledge is required hence the reason for abductive approach that can combine both other approaches to provide insight to the phenomena with no loyalty given to any alternative paradigm (Mackenzie and Knipe, 2006b).”

3.5. Research Method

3.5.1. Research strategy

“The abductive approach assumption of which was used in this study, according to Saunders *et al.* (2009) is a combination of deductive and inductive approaches, which moves back and forward. This approach is usually associated with a survey strategy with the deductive approach putting emphasis on the quantification of data collection and analysis. This research survey incorporates a cross-sectional design whereby data

are predominantly at one stage collected through a questionnaire to receive quantifiable data in association with the independent variables (CSFs) and dependent variable (ERP financial system implementation) of this study. By using a survey design which is highly efficient in obtaining precise information from a study population authors have been capable of describing different characteristics associated with the population, test relationship and assumptions.

Since this study aimed to establish the correlative relationship dependent variable and independent variables and from descriptor-exploratory nature. Data is first collected in-depth of existing literature then secondary through a web-based survey which was then subsequently utilized for further advanced impact analysis."

3.5.2. Methodological choice

In literature research method and methodology is distinctive concepts (Wahyuni, 2012). Methodology apprehends how we reason causally, looking at "what notions guide model building and model testing, models should be constructed and empirically tested, depending on the research question" at that instant (Johnson, Russo and Schoonenboom, 2019). Analogically, a methodology can be seen as a purview or a map, whereas a method refers to a stow of steps to journey between two locations on the map (Jonker and Pennink, 2010). According to Wahyuni (2012), the model to research within the context of a peculiar paradigm refers methodology which encompasses the basal cluster of beliefs that escort a researcher to select one stow of research methods over another. While research method consists of a set of precise procedures, tools and techniques for data collection and analysis.

Wahyuni (2012), report methodologies to be closer research practice that philosophy is to paradigms while highlighting the independence of a research method which is a-theoretical from methodologies and paradigm. Indicating research methods such as interview, survey and experiment to be different from research methodologies which are the ideological and theoretical foundation of a method whereas method is practical applications of doing research. Hence, the importance of the research design is to link a methodology and a correct set of research methods to address questions and or hypotheses of the research that are established to examine social phenomena.

According to Denscombe (2008), the research world consists of three paradigms namely: quantitative, qualitative and mixed methods, each based on a system of philosophical convictions, which are either positivism, constructivism and pragmatism, respectively. Two distinct discourses in literature regarding qualitative and quantitative are often used: research paradigm and research methods. The first discourse focuses on the landscape of knowledge, one's understanding of the world and the final determination of the research whereas the second refers to the method used to collect and analyze data and the type of presentation and generalization obtained from the data (Mackenzie and Knipe, 2006a).

Qualitative research relies on the collection of qualitative data such as “words, pictures, or icons”, these are scrutinized employing thematic exploration (Mackenzie and Knipe, 2006a; Johnson and Christensen, 2008). A qualitative researcher uses a deep and wide angle lens for examination in other to prevent the intervention of natural flow hence employ the use of non-numerical data analysis and collection techniques (Mackenzie and Knipe, 2006a; Saunders *et al.*, 2009). Furthermore, qualitative

methods are most applied given that they are most fitting for the gathering of values, perceptions, people experiences, purposes and context specificities due to their paradigm devotion to in-depth examination (Iofrida *et al.*, 2018a)

By disparity, quantitative research can be seen as a collection of numerical data and exhibition of the relationship view between the empirical findings and theory (Wahyuni, 2012). Quantitative research follows characteristics of a quantitative research paradigm involving the use of statistical analysis to comprehend and interpret numerical input (Johnson and Christensen, 2008).

The explanation of the two-research method elucidates the reason behind the researcher's decision to adopt a mixed method that combines both methods in a research study. According to literature mixed methods are more common and acceptable to the research approaches that are further complex in scheme and flexible in their application of methods. A mixed methods approach to research embroils assembles of both numeric information on instruments and text information on interviews or observation (Mackenzie and Knipe, 2006a). According to Johnson, Russo and Schoonenboom (2019), mixed methods research (MMR) tackle the unending concern of cause-and-effect or causation. Iofrida *et al.* (2018a), highlight the potential of both methods in a research paradigm and in line with qualitative and quantitative study the researcher utilized both at the three-difference phase of this study.

Phase one involved both qualitative and quantitative approaches; Taking qualitative research to illustrate a penchant for nominalism in reporting findings in lieu of specific individuals, clusters, settings, and article. Following a systematic review step

widespread literature review is shepherded within the content scope to investigate and attain in-depth quality indulgent of a phenomenon. While the quantitative research of phase one indicates a liking for universalism within the form of variables. The knowledge obtained from the above application of qualitative method will then use by the researcher to determine the CSFs that will be contextualized in this study for ERP implementation. Additionally, the researcher will conduct a frequency analysis followed by factor analysis which will be applied to extract a set of critical success factors. In phase two the researcher using the qualitative approach will gather data in the form of preference chains adopted from Thompson, Olugbara and Singh (2018), where participants sordid their answers on their own experience and knowledge. Thereafter, the last phase three, to identify the most critical factors, and bring into line the statistical measures to a quantitative study ADVIAN classification tool is utilized by the researcher."

3.6. Time Horizon

"Research study can either be cross-sectional and longitudinal which is what determines the time horizon (Saunders *et al.*, 2009). Studies conducted over a diminutive period of time are referred to as cross-sectional study whereas longitudinal study will be over a longer period. The emphasis of research studies is on a specific phenomenon at one particular time frame. Henceforth, this study is a cross-sectional study as it is done over a brief time of months. Although, it could be contended that this study nature, to explore the financial subsystem of ERP systems would have been appropriate for a longitudinal study as long-term research can describe development

and changes. Due to time scarcity as common with many undertaken research projects adopting cross-sectional study for this research's aim is acceptable as it does not require working with the ERP phenomena over time" (Epizitone and Olugbara, 2020a).

3.7 Chapter Summary

This chapter presents the underpinning methodology impelling the study investigation and it has been reported and published in the Epizitone and Olugbara, (2020a) article that appraises the incorporation of a mixed method approached to tackle and complete the research. The next chapter explicates the data collection, analysis, results, interpretation and summary.

CHAPTER FOUR

DATA COLLECTION, ANALYSIS AND DISCUSSION

4.1 Introduction

The methodology used was based on the compilation of data done in more than one phase, precisely three different phases. These phases employed the use of a systematic literature review followed by data analysis on qualitative and quantitative content analysis that enables the use of systematic analysis steps (Bhatti, 2005; Hentschel, Leyh and Baumhauer, 2019). This chapter expounds on the study location, different phases of data collection and the analysis thereof.

4.2. Study Location Description

This research is undertaken at the Durban University of Technology (DUT), sited in the KwaZulu Natal province, South Africa. The university is a multi-campus university with campuses in Durban and Pietermaritzburg. Started as Technikons in 1900, DUT has undergone a host of influential changes one of which includes the merger of two Technikons ML Sultan and Technikons Natal. DUT is reorienting and redefining itself as a University of Technology and reshaping the institution to its present state from 2007. DUT as a university prioritizes the quality of teaching and learning and among others, strategic objectives focus on applied research that sways strongly towards technology transfer and innovation. The International Association of Universities recognizes DUT as a member. The university used an ERP system with

diverse modules implemented like the financial system. The financial system serves all stakeholder of the university such as students who use it for their fee issues and staff and department for purchases and payments. The intention of this research is to explore ERP implementation in a financial context and identify those factors which are highly perilous for a successful implementation to support financial functions.

4.3. Study Phases

4.3.1. Content Analysis Phase

In this phase content acquired from the assessment of extant literature on CSFs in ERP systems was analysed to pick out CSFs via analysis technique of scope review. A systematic review step was followed and relevant publication from search engines was analysed to provided data required for the next phase (Odunaike, Olugbara and Ojo, 2014; Olugbara, Kalema and Kekwaletswe, 2014). Providing the researcher with the general knowledge gain from the literature aided the researcher to determine CSFs contextualized in relation to the financial system. In addition to the initial content analysis of literature, a frequency analysis was used to get a lot of CSFs. Frequency analysis was constructed on the expanse of occurrences that factors had featured in literature (Finney and Corbett (2007). These factors were deployed further to the fieldwork.

Phase one entailed the clustering of CSFs from 127 research studies found online databases using a systematic content analysis technique. This yielded 205 CSFs and these figures are numbers are in line with the previous study (Nah and Delgado, 2006;

Shaul and Tauber, 2010; Al-Hinai, Edwards and Humphries, 2013). The analysis of the 205 CSFs from these studies was compiled in MS Excel resulted in binary data format displaying the omission and feature of these variables (Ahmad, Haleem and Syed, 2012).

These cover a period of 2001 to 2019, using the keywords CSF, ERP system implementation and key success factors. After which systematic review steps were followed to obtain data for phase two (Odunaike, Olugbara and Ojo, 2014; Olugbara, Kalema and Kekwaletswe, 2014). Thereby, addressing the first research question (RQ1: What is the minimum set of CSFs of ERP system implementation to support financial functions?) using systematic content analysis techniques and frequency analysis similar to previous studies(Ahmad and Cuenca, 2013; Al-Hinai, Edwards and Humphries, 2013; Olugbara, Kalema and Kekwaletswe, 2014; Thompson, Olugbara and Singh, 2018). This method has been used in several related studies and has provided the basis for further evaluation.

4.3.2. Expert Validation Phase

After the first phase, the data sets obtained were further analyzed by the researcher to realize the first research questions; “What is the minimum set of CSFs of ERP system implementation to support financial functions?” While partially addressing the second to ascertain the significance of each identified CSFs in the ERP financial system implementation. After the analysis was performed by the researcher using a statistical method Principal component analysis in SPSS 25 and WEKA 3. Results obtained from the descriptive statistics from the SPSS was used by the researcher to extract variables that were further deployed in phase 3 for expert validation. CSFs were

selected using the mean range of .88 to .018. This yielded 25 factors which were later structured into 20 factors and deployed to experts in completion of the second objective while generating the data for analysis in phase three. The criteria for expert used in this study is detailed as follows.

4.3.2.1. Composition and criteria of expert participants

Experts were used for validating the CSFs construct presented by the researcher for the financial system. Furthermore, expert's inputs were used for the contextualization of this study to establish a contextual structure relationship between the CSFs for implementation that would support financial systems. In similar studies identifying CSFs authors have employed the use of experts to validate their selected CSFs. Table 4.1 summarizes the inclusion of experts in similar studies to validate variables, Authors such as Hentschel, Leyh and Baumhauer (2019) used 11 experts in their study.

Table 4- 1: Expert panel composition in studies Source: Author's own craft

Authors	Study title	Number of Experts
Hentschel, Leyh and Baumhauer (2019)	"Critical Success Factors for the Implementation and Adoption of Cloud Services in SMEs"	11
Bhatti (2005)	"Critical success factors for the implementation of enterprise resource planning (ERP): empirical validation"	Unspecified
Olugbara, Kalema and Kekwaletswe (2014)	"Identifying critical success factors: the case of ERP systems in higher education"	3
Thompson, Olugbara and Singh (2018)	"Deriving critical success factors for implementation of enterprise resource planning systems in higher education institution"	10
Ahmed, Shaikh and Sarim (2017)	"Critical Success Factors Plays a Vital Role in ERP Implementation in Developing Countries: An Exploratory Study in Pakistan"	10

Al-Sabaawi (2015)	"Critical success factors for enterprise resource planning implementation success"	Unspecified
Ashja, Moghadam and Bidram (2015)	"Comparative study of large information systems' CSFs during their life cycle"	39
Campos Fernandes Leandro, Mexas and Drumond (2017)	"Identifying critical success factors for the implementation of enterprise resource planning systems in public educational institutions"	5-70
Parhizkar and Comuzzi (2017)	"Impact analysis of ERP post-implementation modifications: Design, tool support and evaluation"	7

4.3.2.2. Criteria for selection of experts

The researcher in accordance with previous studies uses the following criteria for expert inclusion in the study.

1) The experts must be professional ERP users (Olugbara, Kalema and Kekwaletswe, 2014), consulted to participate in the identified ERP financial success factors by the researcher.
2) Experts play imperative functions in ERP financial implementation in the authors' institution (Thompson, Olugbara and Singh, 2018).

3) The experts must be independent with regards to the subject and heterogeneous (Gallego and Bueno, 2014; Skinner *et al.*, 2015)
4) Knowledgeable in ERP system usage (Ahmed, Shaikh and Sarim, 2017).
5) Top in the field (Ashja, Moghadam and Bidram, 2015).

The selection process in this study incorporated the above-listed criteria supported by Kuusi (1999), who highlighted the conformation of attribute for expert selections. Kuusi (1999) and Lilja, Laakso and Palomäki (2011), postulate the best fit expert to be: top in the field, interested in multidisciplinary knowledge, use an unconventional approach to tackle problems, perceive the existence of different dimensional connections and development between different fields and keen to be involved in something novel. In addition to the criteria, the researcher used a convenience sampling approach for this study which is based on the researcher knowledge due to the limited availability of experts. Sundry authors support this approach to be relevant in providing accurate information (Schmidt *et al.*, 2001; Keil, Tiwana and Bush, 2002; Hedt and Pagano, 2011; Lilja, Laakso and Palomäki, 2011). This study used nine owing to the limited number of experts available in the study area given the complexity and relevance in the organization. This is in line with previous studies that have used a relatively small number of expert's panel of three to five in ideal circumstances as long as experts possessed the greatest experience and knowledge in the field (Worrell, Di Gangi and Bush, 2013; Olugbara, Kalema and Kekwaletswe, 2014; Campos Fernandes Leandro, Mexas and Drumond, 2017).

The experts received an email with the links, logins and supporting documentation from the researcher for the link http://crisufvey.biz.ht/. This was used to access the data collection tool illustrated in figures 4.1 to 4.9.

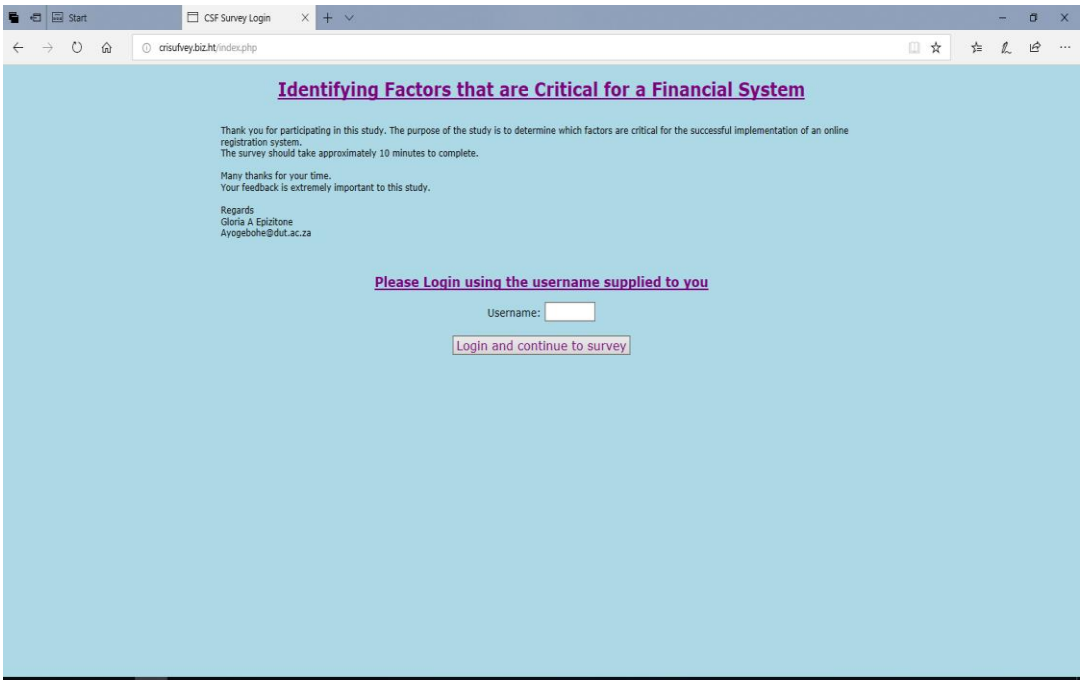


Figure 4- 1: login Page

Source link: http://crisufvey.biz.ht/

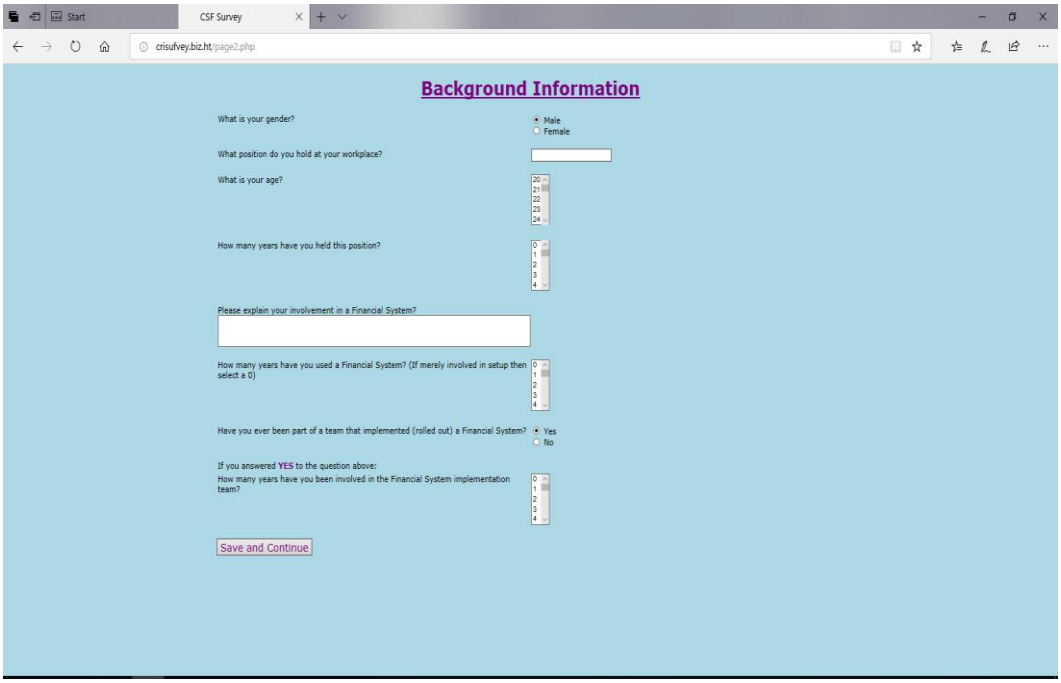


Figure 4- 2: Background Information Page

Source link: http://crisufvey.biz.ht/page2.php

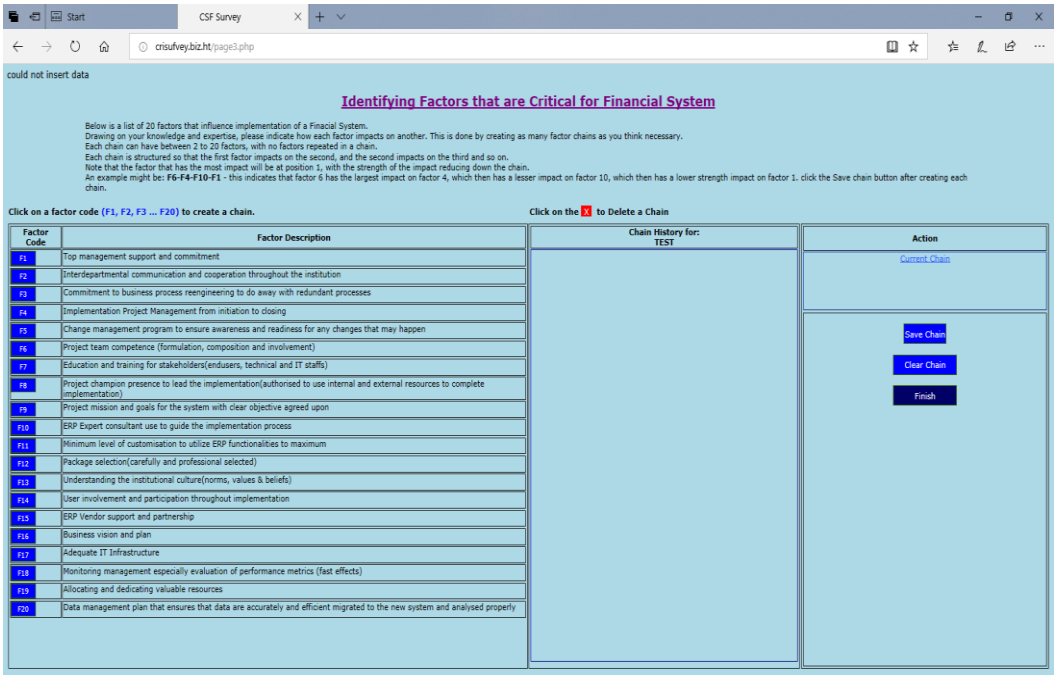


Figure 4- 3: Preference Chain Page

Source link: http://crisufvey.biz.ht/page3.php

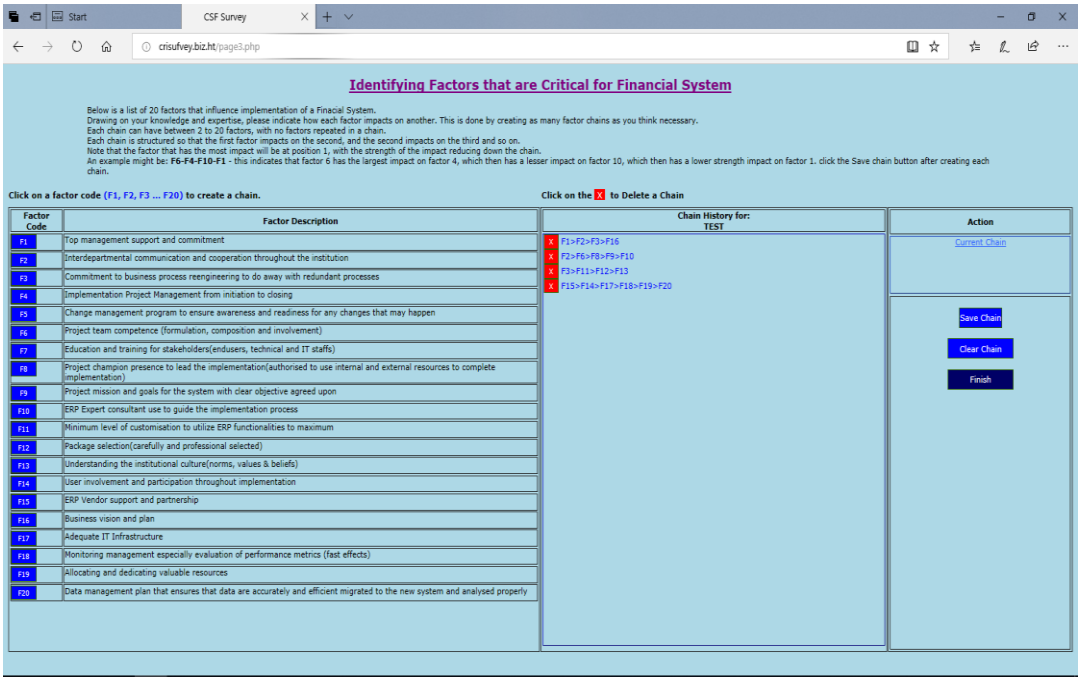


Figure 4- 4: Preference chain list example

Source link: http://crisufvey.biz.ht/page3.php

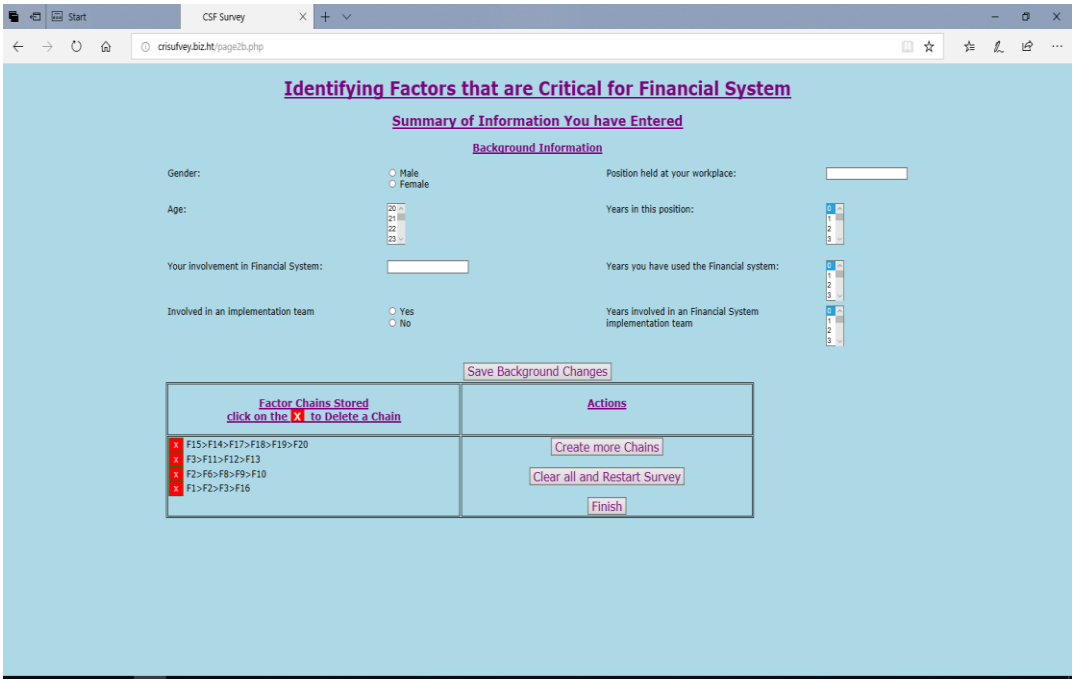


Figure 4- 5: Data input validation Page

Source link: http://crisufvey.biz.ht/page2b.php

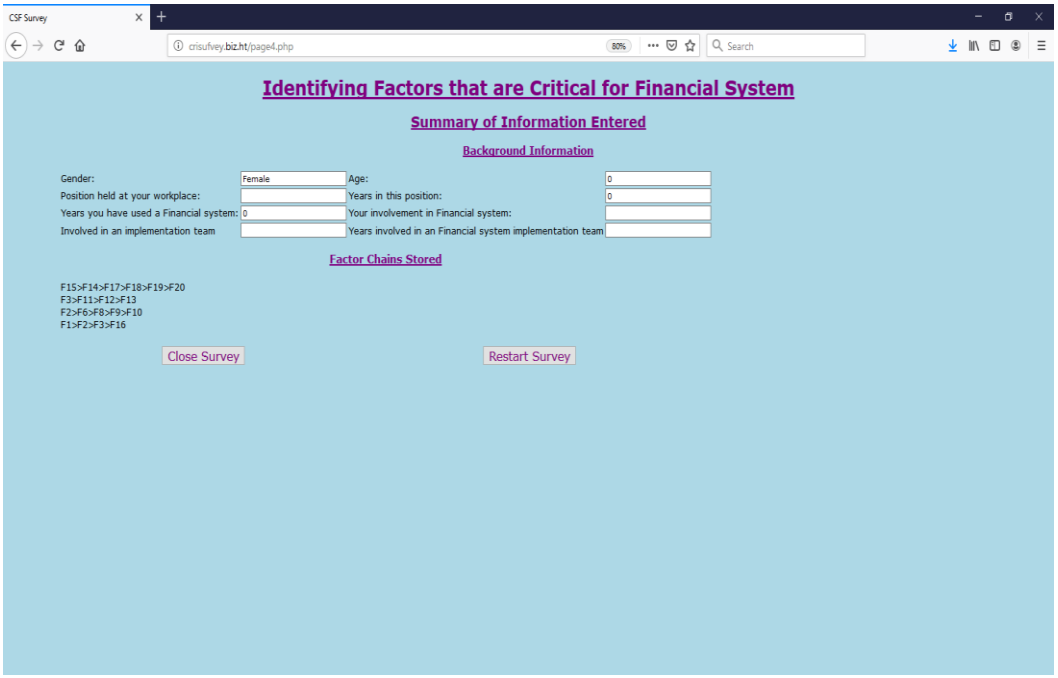


Figure 4- 6: Summary Page

Source link: http://crisufvey.biz.ht/page4.php

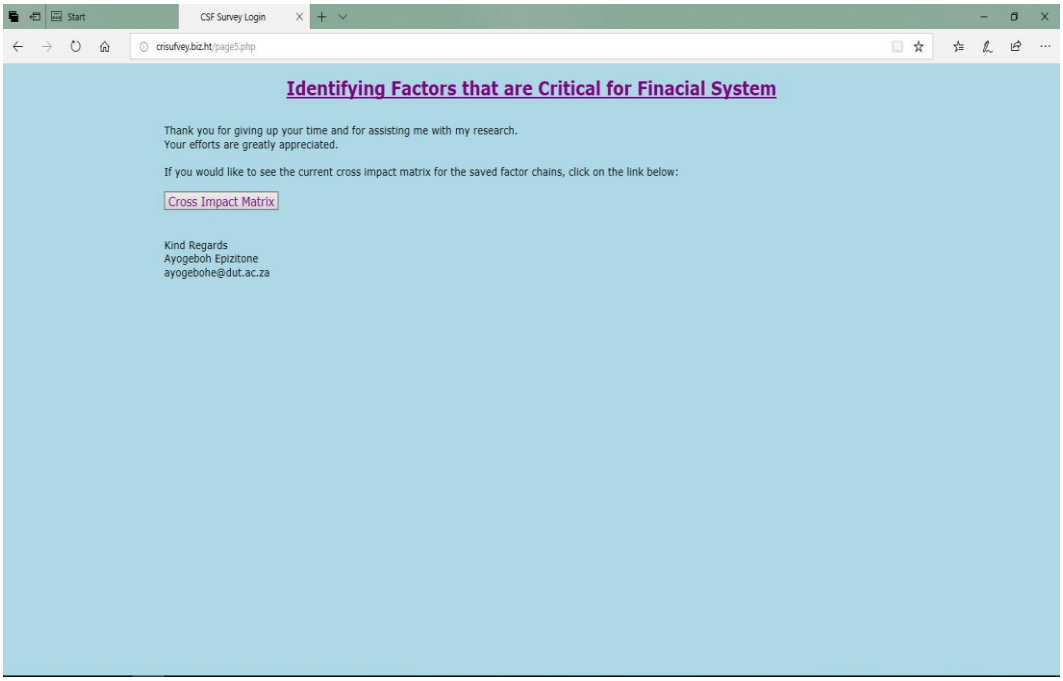
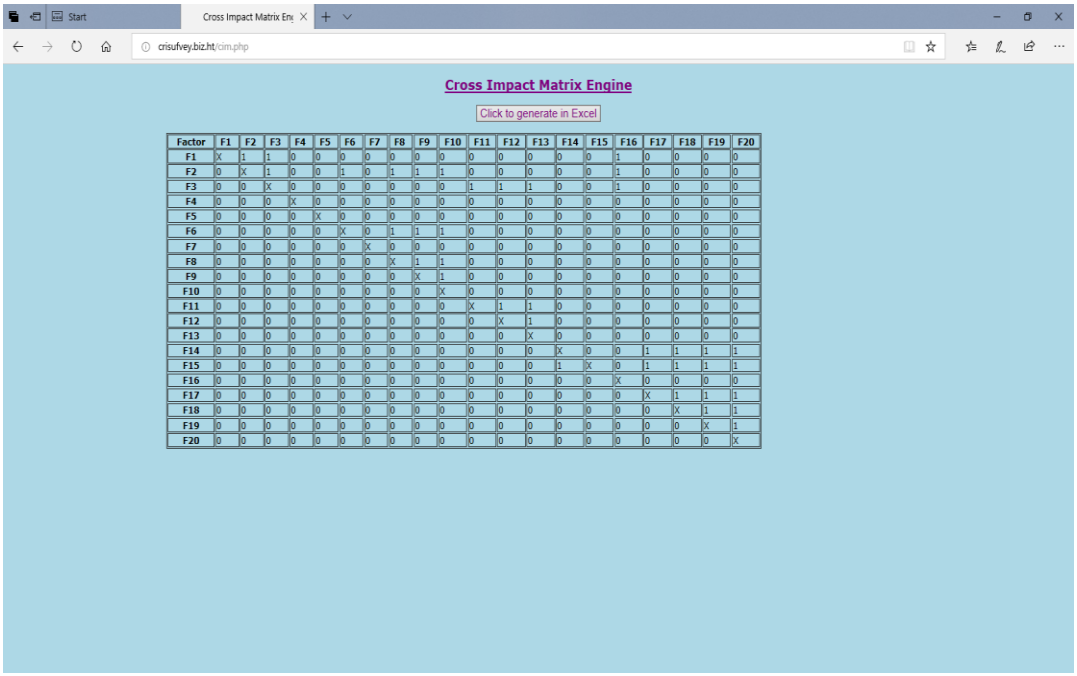


Figure 4- 7 Exit Page

Source link: http://crisufvey.biz.ht/page5.php



Factor	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17	F18	F19	F20
F1	X	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
F2	0	X	1	0	0	1	0	1	1	1	0	0	0	0	0	1	0	0	0	0
F3	0	0	X	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0
F4	0	0	0	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F5	0	0	0	0	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F6	0	0	0	0	0	X	0	1	1	1	0	0	0	0	0	0	0	0	0	0
F7	0	0	0	0	0	0	X	0	0	0	0	0	0	0	0	0	0	0	0	0
F8	0	0	0	0	0	0	0	X	1	1	0	0	0	0	0	0	0	0	0	0
F9	0	0	0	0	0	0	0	0	X	1	0	0	0	0	0	0	0	0	0	0
F10	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0	0	0	0	0
F11	0	0	0	0	0	0	0	0	0	0	X	1	1	0	0	0	0	0	0	0
F12	0	0	0	0	0	0	0	0	0	0	0	X	1	0	0	0	0	0	0	0
F13	0	0	0	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0	0
F14	0	0	0	0	0	0	0	0	0	0	0	0	0	X	0	0	1	1	1	1
F15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	X	0	1	1	1	1
F16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	0	0	0	0
F17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	1	1	1
F18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	1	1
F19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	1
F20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X

Figure 4- 8: Cross Impact Matrix Page

Source link: http://crisufvey.biz.ht/cim.php

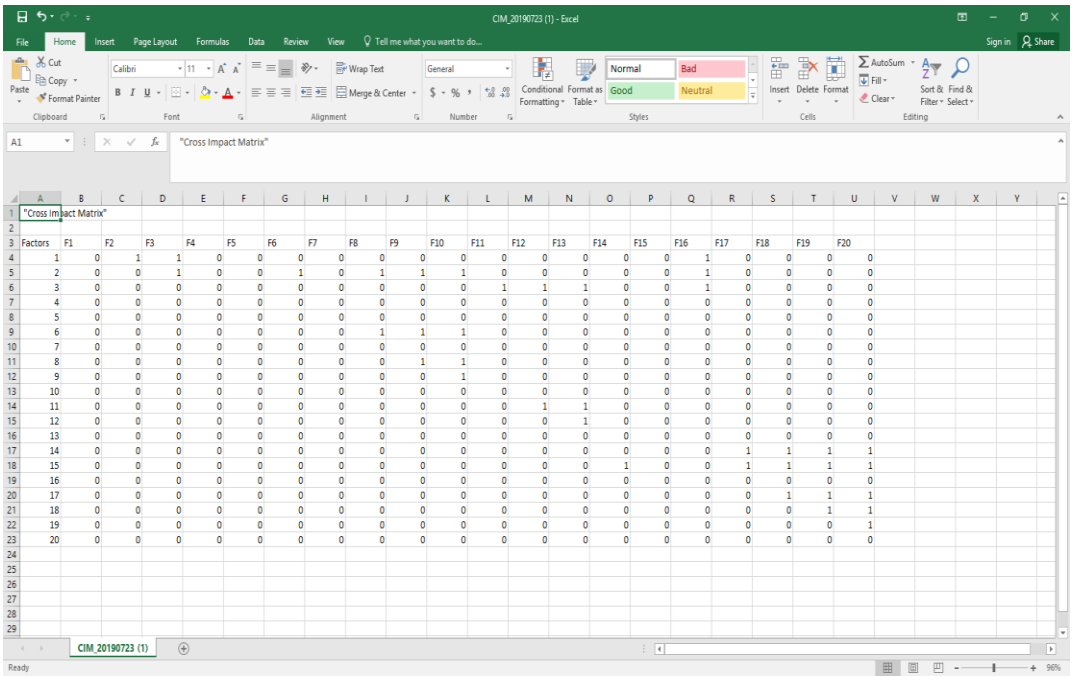


Figure 4- 9 CIM export to Excel

4.3.3. Advance Impact Analysis Phase

Phase three addresses the third research question RQ3: “How can these factors be structure into a comprehensive model to support financial functions?” Using an online survey data collection tool and preference chain approach adopted from Thompson et al. (2018), the researcher was able to accomplish these objectives. The final data collected from experts from the data collection instrument was analyzed further using ADVIAN analysis. The researcher employed the advanced cross impact matrix to classify and structure a model of CSFs to support financial functions.

4.4. Study Reliability and Validity

This research considers the reliability and validity concerns to demonstrate the research rigour and trustworthiness. Reliability refers to the level to which a third party can replicate this study to yield unswerving outcomes ((Bush, 2007; Saunders *et al.*, 2009; Saunders, 2011). While the validity of a study is concerned with the ability to which the study measures it intended to be measured (Saunders *et al.*, 2009).

For the reliability and validity aspect of this study, the researcher has comprehensively detailed the approaches, methodological choices, procedures, data collection and analysis. Thus indicating the robustness of the methods employed and finding validity which can be replicated with adherence to the approach. The methods and data collection triangulation (Bush 2007) of this research also serves as cross-check for validity and reliability. Where the researcher employed different

approach in the different phases to yield accurate, consistent, valid and reliable results in relation to the studies objectives.

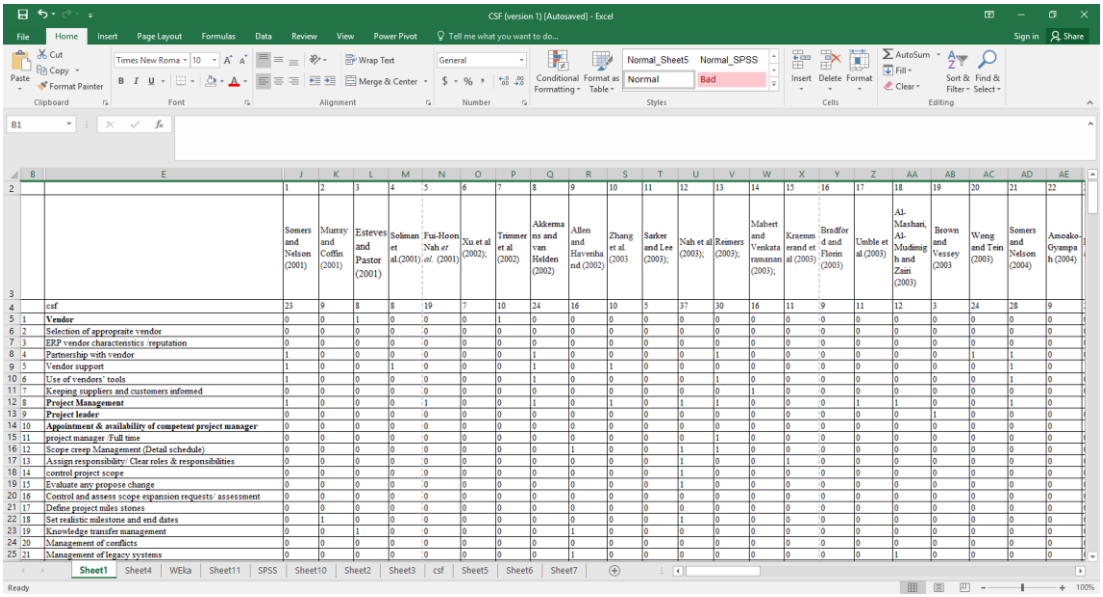
4.5. Analysis of Data

To fulfil the research purpose data analysis was conducted at the different phases for the tenacity of responding to the study questions and objectives set forth in this study in chapter one. From phase one which involved content analysis to extract preliminary CSFs deployed through the online data collection instrument for expert validation to the application of ADVIAN analysis. Software, such as SPSS, Microsoft Excel, and R open source was used to help the researcher analyse data to achieve results for the study. This study analysis and finding will be discussed in this section.

4.5.1. CSFs from review

205 CSFs clustered from literature review were compiled in excel with their presence and absence in the 127-studies presented in binary values of 1 and 0 respectively. Figure 4.10 shows the data compilation in excel. Detailed CSFs cluster from studies

is shown in Appendix C and D



			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
			Somers and Nelson (2001)	Murray and Coffin (2001)	Esteves and Pastor (2001)	Soliman et al.(2001)	Fui-Hoon Nah *et al.* (2001)	Xu et al (2002);	Trimmer et al (2002)	Akkerma ns and van Helden (2002)	Allen and Havenha nd (2002)	Zhang et al. (2003	Sarker and Lee (2003);	Nah et al (2003);	Reimers (2003);	Mabert and Venkata ramanan (2003);	Kraemm erand et al (2003)	Bradfor d and Florin (2003)	Umble et al (2003)	Al-Mashari, Al-Mudimig h and Zairi (2003)	Brown and Vessey (2003	Wong and Teiri (2003)	Somers and Nelson (2004)	Amoako-Gyampa h (2004)
	csf		23	9	8	8	19	7	10	24	16	10	5	37	30	16	11	9	11	12	3	24	28	9
1	**Vendor**		0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Selection of appropriate vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	ERP vendor characteristics /reputation		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Partnership with vendor		1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	1	0
5	Vendor support		1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
6	Use of vendors' tools		1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0
7	Keeping suppliers and customers informed		0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8	**Project Management**		1	0	0	0	1	0	0	1	0	1	0	1	1	0	0	0	1	1	0	0	1	0
9	**Project leader**		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
10	**Appointment & availability of competent project manager**		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	project manager /Full time		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12	Scope creep Management (Detail schedule)		0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0
13	Assign responsibility/ Clear roles & responsibilities		0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0
14	control project scope		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
15	Evaluate any propose change		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
16	Control and assess scope expansion requests/ assessment		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	Define project miles stones		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	Set realistic milestone and end dates		0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
19	Knowledge transfer management		0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
20	Management of conflicts		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	Management of legacy systems		0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0

Figure 4- 10: Compilation of Data for CSFs

4.5.2. Frequency Analysis

The data collected and compiled in excel was further processed in SPSS. The descriptive statistics (table 3) from the SPSS was used by the researcher to extract variables that were further deployed in phase 3 for expert validation. Selected CSFS were selected using the mean range of .88 to .21. 23 factors were later structured into 20 factors (Table 4). Critical success factors closely related were combined such as vendors, data, education, and monitoring, partnership with vendor and vendor support combined with ERP Vendor support and partnership, general education and training for users and other stakeholders, and lastly monitoring management with evaluation of performance metric. These 20 CSFs were subjected to the latter stage for expert judgement for the input for ADVIAN analysis. The 20 CSFs presented fulfilled the first objectives; to identify a minimal lot of acute factors for ERP enactment that aids

financial function which riposte the first Research question “What is the minimum set of CSFs of ERP system implementation to support financial functions?”

Table 4- 2: Descriptive Statistics of CSFs

	Descriptive Statistics						
		Sum	Mean		Std. Deviation	Variance	
		Statistic	Statistic	Std. Error	Statistic	Statistic	
1	F4	27	0.21	0.036	0.411	0.169	Partnership with vendor
2	F5	37	0.29	0.040	0.456	0.208	Vendor support
3	F8	79	0.62	0.043	0.487	0.237	Project Management
4	F29	87	0.69	0.041	0.466	0.217	Interdepartmental communication and cooperation
5	F34	72	0.57	0.044	0.497	0.247	Change management
6	F38	40	0.31	0.041	0.466	0.217	Understanding the organizational culture / (norms, values & beliefs)
7	F43	72	0.57	0.044	0.497	0.247	Project team competence (formulation, composition and involvement)
8	F50	29	0.23	0.037	0.421	0.178	Allocating valuable resources/Dedicating resources
9	F74	44	0.35	0.042	0.478	0.228	Use of consultants (Consultant selection and relationship)
10	F88	51	0.40	0.044	0.492	0.242	Project champion
11	F89	61	0.48	0.045	0.502	0.252	Education and training
12	F91	52	0.41	0.044	0.494	0.244	Education and training to end users
13	F96	112	0.88	0.029	0.324	0.105	Top management support

14	F106	36	0.28	0.040	0.452	0.205	Business vision
15	F107	46	0.36	0.043	0.483	0.233	Project mission / goals (Clear Goals and Objective)
16	F110	84	0.66	0.042	0.475	0.226	BPR
17	F111	40	0.31	0.041	0.466	0.217	User involvement
18	F120	44	0.35	0.042	0.478	0.228	Level of Customization
19	F136	34	0.27	0.039	0.445	0.198	IT Infrastructure
20	F144	27	0.21	0.036	0.411	0.169	Data Management
21	F152	43	0.34	0.042	0.475	0.226	Package selection
22	F164	28	0.22	0.037	0.416	0.173	Monitoring management
23	F165	30	0.24	0.038	0.426	0.182	Monitoring and evaluation of performance metrics (fast effects)

Table 4- 3: Minimum set of CSFs for financial ERP system

	20 Top CSFs	Frequencies
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 Project Management from initiation to closing"	79
5	"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 clear objective agreed upon"	46
10	"ERP Expert consultant use 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 efficient migrated to the new system and analyzed properly"	27

Source: Author (Epizitone and Olugbara, 2019)

4.6. Chapter Summary

This chapter expounds on the data collection, analysis and discussion pertaining to the study location, inclusion and exclusion criteria and the different phase's method. The study reliability and validity was also presented along with the preliminary data analysis. The ensuing chapter explicates the research findings and discourse.

CHAPTER: FIVE

RESEARCH FINDINGS AND DISCUSSIONS

5.1. Introduction

This chapter discusses the analysis and presents discoveries from the data collections. The previous two chapters provided information and contributions to the fulfilment of the first objective and question of this research study. The resulted data were then subjected to expert validation in order to address the subsequent objectives and questions. The analysis of data collected from expert input and discussion of the findings in relation to financial systems in direct response to the second and third research objectives and research questions was conducted.

Objective 2: To explore the significance of each CSFs in financial sub-systems mediated by successful implementations.

Objectives 3: To investigate an effective model that when adopted would support financial functions.

Research Question 2: What are the significances of each factor identified for the financial system like financial sub-systems?

Research Question 3: How can these factors be structure into a comprehensive model to support financial functions? Through the ADVIAN these objectives are realized.

5.2. ADVIAN Analysis and Discussion

The advance impact analysis (ADIAN®) method (Linss and Fried, 2009, 2010) is employed in this research to determine the "cross impact analysis" which proffers room for organizations to reconnoiter contemporary trials and sufficiently prepare decision for future endeavours in a participatory (Linss and Fried, 2009; Olugbara, Kalema and Kekwaletswe, 2014; Thompson, Olugbara and Singh, 2018). Impact analysis has expansively been used formerly in scenario techniques and imminent undertakings (Linss and Fried, 2009; Guertler and Spinler, 2015). Currently, within performance measurements, it is employed to chart palpable and incorporeal relationships ((Linss and Fried, 2009; Guertler and Spinler, 2015; Thompson, Olugbara and Singh, 2018).

The cross-impact scheme uses an impact matrix that is completed based on the strength of the impact of the concerned variables. Several measures that have been used are not limited to the 0 to 3 range, where 0 signifies "no impact", 1 "low or weak impact", 2 "average or medium" to 3 for "high and strong impact" (Linss and Fried, 2009; Thompson, Olugbara and Singh, 2018). This study uses a normalized cross impact matrix with the impact normalized to 0 to 1 range (Thompson, Olugbara and Singh, 2018 Epizitone and Olugbara, 2020c). Where 0 to 0.25 signify no impact,0.26 to 0.5 1 low or feeble impact, 0.51 to 0.75 average or medium and 0.76 to 1 for high and strong impact The inability of the early cross impact technique to analyze indirect interrelationships gave rise to the method MIMAC an alternative cross impact methods which addressed this inadequacy (Guertler and Spinler, 2015). Nevertheless, this technique with other cross impact analysis like Papier computer and Fuzzy approach

have deficits in their classification. As each either considered one aspect either direct or indirect interrelation of the variables and fail to deal with another (Linss and Fried, 2009; Fried, 2010; Linss and Fried, 2010; Guertler and Spinler, 2015; Thompson, Olugbara and Singh, 2018).

Although the ADVIAN is an enhanced and refined cross impact analysis that enhances quantitative methods for investigating interdependency it, however, seems limited in that it does not determine the impact factors condition but their interactions(Linss and Fried, 2010). Therefore, ADVIAN does not provide the standing of a system but identifies vital factors obligatory for the entire system performance and regulation which justify the use.

Furthermore, ADVIAN is favoured over others for reasons like the ability to afford innate insights where other methods have demonstrated insufficiency to stipulate an understanding of the reciprocated relationship between a single resource (Linss and Fried, 2009; Fried, 2010; Linss and Fried, 2010; Thompson, Olugbara and Singh, 2018). It is also apt for explorative modelling that incapacitates the cul-de-sac of privation of theory- based computational model due to derisory theoretical progression, interrelationships establishing and mutual connection constructed on expert judgement (Bañuls, Turoff and Hiltz, 2013; Guertler and Spinler, 2015).

The ADVIAN is the modified methodology of cross impact analysis with capabilities that analyse all interrelationships in all kinds of cross impact matrix along with performing supplementary measures and ranking namely: criticality, stability integration, driven, driving and precarious (Linss and Fried, 2010; Guertler and Spinler, 2015; Thompson, Olugbara and Singh, 2018)

5.2.1. Application of ADVIAN

During data collection, the research requested the expert participants to generate a preference list of the factors in the study. As mentioned before, this study analysis builds on the preference chain principle introduced by Thompson (Thompson, Olugbara and Singh, 2018). The input from the expert participant generates a cross impact matrix (CIM). The preference list approach enhances the cross-impact analysis using the preference relationships to create the list. A preference list is created from a set of 20 factors, which then can be used to extract sets of preference relations. For "n" factors the preference relation on a set is obtained by $(n^2-n)/2$ where n >1

An illustration of this can be explained by looking at an expert response to the evaluation from a set of 20 impact factors using the list with n = 3, n=4, n=5 indicating that there will be a set of 3, 6 and 10 preference relations.

For list (F5>F20,>F14), we will have these 3 sets of preference relations (F5, F20), (F5, F14), (F20, F14).

List where n =4 (F1>F2>F10>F4) there will be 6 sets of a preference relation

(F1, F2), (F1, F10), (F1, F4), (F2, F10), (F2, F4), (F10, F4)

And n=5 (F1>F7>F17>F11>F6) there will be 10 sets of a preference relation

(F1, F7), (F1, F17), (F1, F11), (F1, F6), (F7, F17), (F7, F11), (F7, F6), (F17, F11), (F17, F6), (F11, F6).

For the first list above (F5>F20,>F14), the other pair (F5, F20), (F20, F14) exit twice in the preference list hence the score of 2 will be allocated to each while the other will receive 1 since it appears once. A normalized cross impact matrix is generated from

the data collection tool described in chapter 4 shown and in table 5.1. Cross impact Matrix from the study

Table 5- 1: Normalized cross impact matrix for 20 critical success factors

Factors	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17	F18	F19	F20
F1	0.0	1.0	1.0	0.7	0.8	0.9	0.9	0.7	0.7	0.9	0.4	0.6	0.9	0.7	0.8	0.7	1.0	0.3	0.7	0.7
F2	0.0	0.0	0.4	0.2	0.2	0.4	0.3	0.4	0.2	0.4	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.2
F3	0.0	0.3	0.0	0.2	0.4	0.3	0.6	0.3	0.3	0.3	0.3	0.6	0.4	0.6	0.3	0.3	0.3	0.2	0.2	0.3
F4	0.1	0.4	0.3	0.0	0.4	0.6	0.3	0.4	0.1	0.3	0.4	0.3	0.2	0.6	0.4	0.2	0.2	0.3	0.2	0.4
F5	0.0	0.3	0.4	0.1	0.0	0.3	0.3	0.2	0.2	0.4	0.3	0.4	0.1	0.7	0.2	0.3	0.2	0.2	0.1	0.4
F6	0.0	0.1	0.2	0.0	0.2	0.0	0.0	0.6	0.2	0.2	0.3	0.2	0.2	0.3	0.1	0.1	0.0	0.2	0.0	0.2
F7	0.0	0.4	0.3	0.1	0.3	0.6	0.0	0.2	0.2	0.4	0.6	0.4	0.2	0.6	0.3	0.3	0.3	0.3	0.2	0.3
F8	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.4	0.3	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.2
F9	0.1	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.0	0.4	0.2	0.4	0.3	0.3	0.2	0.1	0.3	0.3	0.3	0.2
F10	0.0	0.2	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.3	0.6	0.4	0.6	0.3	0.3	0.3	0.2	0.3	0.2
F11	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.1	0.2	0.0	0.0	0.0	0.2	0.0	0.1
F12	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.2	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
F13	0.1	0.2	0.2	0.1	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.0	0.3	0.2	0.1	0.1	0.3	0.4	0.3
F14	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.2	0.1	0.0	0.2	0.2	0.3	0.0	0.1	0.1	0.0	0.2	0.0	0.3
F15	0.0	0.3	0.3	0.0	0.3	0.4	0.1	0.3	0.2	0.3	0.4	0.4	0.6	0.4	0.0	0.4	0.1	0.3	0.4	0.3
F16	0.0	0.3	0.3	0.1	0.2	0.3	0.2	0.3	0.3	0.2	0.4	0.4	0.6	0.3	0.3	0.0	0.2	0.3	0.4	0.3
F17	0.0	0.4	0.3	0.1	0.3	0.6	0.4	0.3	0.2	0.3	0.4	0.3	0.6	0.3	0.6	0.4	0.0	0.4	0.4	0.2
F18	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
F19	0.0	0.3	0.2	0.1	0.2	0.3	0.1	0.2	0.1	0.3	0.3	0.2	0.3	0.6	0.2	0.1	0.1	0.3	0.0	0.3
F20	0.0	0.4	0.2	0.1	0.1	0.2	0.3	0.2	0.1	0.2	0.4	0.2	0.1	0.4	0.1	0.0	0.2	0.3	0.1	0.0

Source: Author (Epizitone and Olugbara, 2020b)

The data analysis is aimed at assessing the role of each CSFs for ERP enactment that aids financial functions. The first step involved the calculation for the direct active and passive sum for the CIM which includes n = 20 CSFs. The influencing critical success factor *i* interrelationship with the affecting critical success factor *a* is denoted as R_{ia}.

For a critical success factor c, the direct active sum which is the might of its impact on other critical success factors is denoted as dAS(c), this is gotten by combing all the interrelationships of the cross-impact matrix (equation 5.1)

$$dAS(c) = \sum_{a=1}^{n} (R_{c,a}) \quad (5.1)$$

The degree to which the other critical success factors affects the factor c is represented by the direct passive sum which is denoted as dPS(c) which is obtained by adding all the interrelationships in a column (equation 5.2)

$$\mathrm{dPS}(c) = \sum_{i=1}^{n} (R_{i,c}) \quad (5.2)$$

While the first two equations provide interrelationships for the first order, the matrix contained extended orders. Forwarding this order down the line from the first goes up to several more k order. A cross impact matrix with n critical success factors there will be k = n-1 for all possible interrelationship. This quantifies the relationship while considering all the orders ((Linss and Fried, 2009, 2010). Equations 5.3 and 5.4 are used to obtain the active sum and passive sum respectively for the critical success factor n for the k order. Appendix A and B show all the orders calculated for this study.

$$dAS_k(c) = \sum_{a=1}^{n} (R_{c,a} * dAS_{k-1}(a)) \quad (5.3)$$

$$dPS_k(c) = \sum_{i=1}^{n} (R_{i,c} * dPS_{k-1}(i)) \quad (5.4)$$

Combining all the interrelationship from the first order to the k order obtained by the application of the above equation 5.3 and 5.4 would give the indirect active sum and passive sum . The indirect active sum iAS(c) is the summation of all the direct active sum (first order to k order) Equation 5.5. While the iPS (c) indirect passive sum is the summation of all the passive sum of the specific critical success factors equation 5.6.

$$iAS(c) = \sum_{k=1}^{n} (dAS_k(c)) \quad (5.5)$$

$$iPS(c) = \sum_{k=1}^{n} (dPS_k(c)) \quad (5.6)$$

The relative sum for both active and passive sums is converted using the maximum common in the range (Fred 2010; Guertler and Spinler 2015). This conversion determine the dAS' and dPS' are shown in equations 5.7 and 5.8

$$dAS'(c) = \frac{dAS(c)}{max_{r=1}^{n}\{dAS(c); dPS(c)\}} * 100 \quad (5.7)$$

$$dPS'(c) = \frac{dPS(c)}{max_{r=1}^{n}\{dAS(c); dPS(c)\}} * 100 \quad (5.8)$$

Following the same methodology, the calculation of the relative indirect sum for the active and passive iAS' and iPS' is expressed in relation to their common maximum (equation 5.1 and 5.2)

$$iAS'(c) = \frac{iAS(c)}{max_{r=1}^{n}\{iAS(c); iPS(c)\}} * 100 \quad (5.9)$$

$$iPS'(\mathrm{c}) = \frac{iPS(c)}{max_{r=1}^{n}\{iAS(c); iPS(c)\}} * 100 \qquad (5.10)$$

Criticality, integration and stability measure of the critical success factor is calculated accordingly (Linss and Fried, 2009; Guertler and Spinler, 2015). The critical factors have major impacts on the system and are profoundly exaggerated by other factors. Slight changes to these variables cause dramatical changes due to the system behaviour for these variables being volatile (Guertler and Spinler 2015). Mutually reinforcing the crucial success factors provide a favourable feedback loop that requires special attention to implementation management. The criticality C(c) is the "geometric mean" of iAS'(c) and iPS'(c) in equation 5.11.

$$C(c) = \sqrt{iAS'(c) * iPS'^{(c)}} \qquad (5.11)$$

Integration I(c) of the critical success factor is the arithmetic mean of the iAS'(c) and iPS'(c) is obtained using equation 5.12. A strong interrelation of the critical factors that exist in the system is indicated by a high level of integration which is interconnected.

$$I(C) = \frac{iAS'^{(C)} + iPS'(C)}{2} \qquad (5.12)$$

The stability of the variable inclined to buffers mutual and dynamic connections which necessitate undesirable feedback loops. Stability S(c) of the variables is 100 less the "harmonic mean" of iAS'(c) and iPS'(c) equation 5.13.

$$S(c) = 100 - \frac{2}{\left(iAS'(c)\right)^{-1} + (iPS'(C))^{-1}} \qquad (5.13)$$

Precarious, driving and driven calculations for the critical success factors are used to rank the factors in the system. The equation for precarious for the variable is the "geometric mean of the indirect active sum and criticality" given by equation 5.14

$$P(c) = \sqrt{C(c) * iAS'(c)} \tag{5.14}$$

Driving is the non-critical success factors with a high active sum which is obtained by calculating the "geometric mean of the indirect active sum by a 100 less the criticality" equation 5.15.

$$D(c) = \sqrt{100 - C(c) * iAS'(c)} \tag{5.15}$$

Driven is the converse of the driving which replaces the indirect AS with the indirect PS. Thus, providing factors that are "non-critical" with huge passive sum equation 5.16.

$$T(c) = \sqrt{100 - C(c) * iPS'(c)} \tag{5.16}$$

5.3. Study Findings

The following section presents the findings of this study for the exploratory study of CSFs interrelation for an ERP system that would support financial systems. In line with the research scope, the data collection and analysis was based on the experts' opinions of nine participants. A base level indulgent of all the expert participants was succeeded via making available comprehensive information and framework of the study to all involved.

The data collection instrument was emailed to each participant after a prior meeting and phone call. At the time of analysis, many participants who were invited to be part of the study had not met their obligation. Given the nature of the study and the timeframe a minimum of 4 to 5 were accepted in line with previous studies (Worrell, Di Gangi and Bush, 2013; Olugbara, Kalema and Kekwaletswe, 2014; Campos Fernandes Leandro, Mexas and Drumond, 2017). Hence, this study had 9 expert participants who provided their opinion on the interrelationships of CSFs for ERP system in relation to financial functions.

Table 5.2 details the demography of the expert participants, which includes the age, gender, and work position, duration of the positions, involvement, and brief function. Among the experts, an average of 49 years was obtained which indicated that most of the experts are mature with many years of experience and knowledge in the area. These statistic also correlate to their position as 44% held managerial positions while an average tenure of 8 years can be seen. Among all the expert participant only one had used the system for below 10years. There is a high percentage recorded for the usages of the system from 10 to 40 years range. 67% had used the system for more than 10 years and 22% for more than 26 years.

An average of 20 years supports the selection of experts and validate their knowledge in the field. On the evaluation of their involvement in the implementation team among the experts on 2 was not involved yielding a 56 % involvement in implementation. Considering these and the duration with an average of 11 years it can be said that experts possess the necessary independent experiences, knowledge and fit into the heterogeneous criterion for inclusion in the study. The varied job descriptions also

supports the diversity of experience and knowledge required to be classified as professional in the field with important roles played. In addition to the above evaluation, experts were not limited to DUT only but involved the developers who were the product owners and responsible for the implementation of the financial systems. Table 5-2 presents the demographics for this study.

Table 5- 2: study Demographic

Item	Range	Frequency	Percentage %	Average
Experts	9	9	100	N/A
Age	Below 30	0	0%	49 years
	31- 40 years	2	22%	
	41- 50 years	3	33%	
	50+ years	4	44%	
Gender	Female	2	22%	N/A
	Male	7	78%	
Position	Salaries Officer	2	22%	N/A
	DIRECTOR Fin Operation/HoD/Acting IT	2	22%	
	Manager: Payroll/info Sys/biz dev /PMO	4	44%	
	Product Owner	1	11%	
Years in position	Below 5 years	4	44%	8 years
	5 – 10 years	2	22%	
	11 – 15 years	1	11%	
	16 – 20 years	2	22%	
Year they used system	Below 10 years	1	11%	20 years

	11 – 25years	6	67%	
	26 – 40years	2	22%	
Implementation team involvement	YES	5	56%	N/A
	No	2	22%	
Years involved	Below 10 years	5	56%	11 years
	11 – 25years	3	33%	
	26 – 40years	1	11%	
Involvement	(functioning) To ensure DUT Employees, permanent are paid their...			
	I use the ITS Payroll System.			
	(Resource allocation) Set budgets for the two departments I run.			
	running of the system			
	My role is to control maintenance and enhancement...			
	Consultant, Trainer and Demonstration Specialist			
	System owner for ITS Integrator Finance system...			

5.7 Results of ADVIAN

As outlined earlier the CSFs evaluation scheme was subject to four differentiated groups (0 to 0.25 no impact, 0.26 to 0.51 low or weak impact, 0.51 to 0.75 average or medium and 0.76 to 1 for high and strong impact). The experts provide an evaluation of the CSFs that would support financial systems in the form of a preference list which was normalized to 0 to 1 CIM shown in (table 5.1) above. Application of the ADVIAN on the CIM yield results that provide insight into the interrelationship of CSFs. The normalized CIM assess the relationship of each of the CSFs to attain the second study objective. The interrelationship between the CSFs for a successful financial system implementation can be inveterate which reveal a maximum dAS(c) of 14.1 and maximum dPS(c) of 7.7. These are above the average of 5.09 for the direct active and

passive sum which dictates how the CSFs impact the implementation of ERP systems at vary levels. The average dAS'(c) is 30.06 and dPS'(c) is 65.42 for the direct relationship, while for the indirect iAS' (c) an average of 32.07 and iPS'(c) is 62.51. A strong influence on the system implementation is exerted by CSFs with high levels which in turn have a lesser influence on other CSF in the system. It seems to imply the impact of the CSFs across the ERP system increases where implemented and affect lower points. Table 5.3 present the result of the application of all the equation discussed above. To assess the attributes of the CSFs further more detailed analysis is applied to know CSFs with values that exceed the average by two third of the standard deviation (Guertler and Spinler 2015; Thompson, Olugbara and Singh 2018). To further assess the factors an additional analysis which considers the factors which is position below the average not as much as two-thirds of the standard devotion. These measurements are further discussed later on in the subsequent sections in alignment with the study objectives.

Table 5- 3: CSFs Measurement

CSF	dAS	dPS	dAS'(c)	dPS'(c)	iAS'(c)	iPS'(c)	C(c)	I(c)	S(c)	P(c)	D(c)	T(c)
	"direct Active Sum"	"direct Passive Sum"	"Relative Active Sum"	"Relative Passive Sum"	"Relative indirect Active Sum"	"Relative indirect Passive Sum"	"Criticality"	"Integration"	"Stability"	"Precarious"	"Driving"	"Driven"
F1	14.11	0.44	100	5.71	100	5.86	24.22	52.93	88.92	49.21	87.05	21.08
F2	5.56	5.89	39.37	75.71	36.01	69.06	49.87	52.53	52.67	42.37	42.49	58.84
F3	6.56	5.56	46.45	71.42	41.81	64.65	51.99	53.23	49.22	46.63	44.8	55.71
F4	6.56	2.44	46.45	31.43	41.86	25.91	32.93	33.88	68	37.13	52.98	41.68
F5	5.56	4.67	39.37	60	34.15	53.47	42.73	43.81	58.32	38.2	44.22	55.34
F6	3.33	6.56	23.62	84.28	19.16	78.44	38.77	48.8	69.2	27.26	34.25	69.3
F7	6.33	4.67	44.88	60	37.89	53.64	45.08	45.76	55.59	41.33	45.62	54.27
F8	4.11	5.44	29.13	70	27.67	69.87	43.97	48.77	60.36	34.88	39.37	62.57
F9	5.22	4.11	37	52.85	34.78	52.3	42.65	43.54	58.23	38.51	44.66	54.77
F10	5	5.78	35.43	74.28	30.48	67.77	45.45	49.12	57.95	37.22	40.78	60.8
F11	1.67	6.44	11.81	82.85	8.54	85.56	27.03	47.05	84.47	15.2	24.97	79.01
F12	2.22	6.89	15.75	88.57	13.67	92	35.46	52.83	76.2	22.01	29.7	77.06
F13	4.89	6.33	34.64	81.43	31.73	79.04	50.08	55.39	54.71	39.87	39.8	62.81
F14	2.33	7.78	16.53	100	12.76	100	35.73	56.38	77.36	21.35	28.64	80.17
F15	6	5	42.52	64.28	35.52	57.91	45.35	46.71	55.97	40.14	44.06	56.26
F16	5.89	4.11	41.73	52.85	36.12	48.61	41.9	42.37	58.55	38.9	45.81	53.14
F17	6.89	4.11	48.82	52.85	43.28	45.2	44.23	44.24	55.78	43.75	49.13	50.21
F18	1	5.44	7.09	69.99	5.79	74.65	20.79	40.22	89.25	10.97	21.42	76.89
F19	4.56	4.56	32.28	58.57	26.58	54.86	38.19	40.72	64.19	31.86	40.54	58.23
F20	4	5.56	28.34	71.42	23.68	71.36	41.11	47.52	64.44	31.2	37.34	64.83

"F1,Top management support and commitment; F2,Interdepartmental communication and cooperation throughout the institution; F3,Commitment to business process reengineering to do away with redundant processes;F4,Implementation of project management from initiation to closing; F5,Change management program to ensure awareness and readiness for any changes that may happen; F6,Project team competence (formulation, composition and involvement); F7,Education and training for stakeholders (end users, technical and IT staffs); F8,Project champion presence to lead the implementation (authorized to use internal and external resources to complete implementation); F9,Project mission and goals for the system with clear objective agreed upon; F10,ERP Expert consultant use to guide the implementation process; F11,Minimum level of customization to utilize ERP functionalities to maximum; F12,Package selection (carefully and professional selected); F13,Understanding the institutional culture (norms, values & beliefs); F14,User involvement and participation throughout implementation; F15,ERP Vendor support and partnership; F16,Business vision and plan; F17,Adequate IT infrastructure; F18,Monitoring management especially evaluation of performance metrics (fast effects); F19,Allocating and dedicating valuable resources; F20,Data management plan that ensures that data are accurately and efficient migrated to the new system and analyzed properly"

5.7.1. Direct and indirect relationship

The interrelationship is express by the active and passive sum which respectively provide insightful knowledge on the critical success factors impacts. The direct relationship is expounded by the active sum which divulges the notch to which a CSF will impact implementations. Whilst, the passive sum demonstrated the indirect relation which is the degree to which the system affects the CSFs. “To permit the use of any number of factors in each system the relative figure is obtained by converting the active and passive sum to 100 from 0” (Epizitone and Olugbara, 2020b). Table 5.4 shows the results from Equation 5.1, 5.2, 5.7 and 5.8.

Direct Relationship produces a high relative value for the active sum (AS) of 100 for Factor 1 which has the maximum impact on the system F1 (Top management support and commitment) base on its bearing on others in the system. Factor F17 (Adequate IT Infrastructure) is the second with a 48.82 value while factor F3 “(Commitment to business process reengineering to do away with redundant processes)” and F4 “(Implementation Project Management from initiation to closing)” follows a value of 46.45.

For the PS that reveals the factors unswervingly influence and exaggerated by other factors in the system, F14 “(User involvement and participation throughout implementation)” has the highest relative’s PS of 100 indicting it to be the most exaggerated and influenced by the other factors. F12 “(Package selection -carefully and professional selected)” has a relative PS of 88.57. Three other factors have relative PS of 84.28, 82.85 and 81.43. These factors are in respective orders; F6 “(Project team competence formulation, composition and involvement)”, F11 “(Minimum level of

customization to utilize ERP functionalities to maximum)" and F13 "(Understanding the institutional culture-norms, values & beliefs)"

Table 5- 4: Direct active and passive sum results.

CSFs	dAS	dAS'(c)	Ranking by dAS'(c)	dPS(c)	dPS'(c)	Ranking by dPS'(c)
F1	14.11	100	1	0.44	5.71	20
F2	5.56	39.37	9	5.89	75.71	6
F3	6.56	46.45	3	5.56	71.42	8
F4	6.56	46.45	4	2.44	31.43	19
F5	5.56	39.37	8	4.67	60.00	14
F6	3.33	23.62	16	6.56	84.28	3
F7	6.33	44.88	5	4.67	60.00	13
F8	4.11	29.13	14	5.44	70.00	10
F9	5.22	37.00	10	4.11	52.85	16
F10	5.00	35.43	11	5.78	74.28	7
F11	1.67	11.81	19	6.44	82.85	4
F12	2.22	15.75	18	6.89	88.57	2

F13	4.89	34.64	12	6.33	81.43	5
F14	2.33	16.53	17	7.78	100.00	1
F15	6.00	42.52	6	5.00	64.28	12
F16	5.89	41.73	7	4.11	52.85	17
F17	6.89	48.82	2	4.11	52.85	18
F18	1.00	7.09	20	5.44	69.99	11
F19	4.56	32.28	13	4.56	58.57	15
F20	4.00	28.34	15	5.56	71.42	9
Average	**5.09**	**36.06**		**5.09**	65.42	
STD DEV	**2.74**	**19.39**		**1.62**	20.83	
AVG+2/3std Dev	**6.91**	**48.99**		**6.17**	79.31	
AVG-2/3std Dev	**3.26**	**23.13**		**4.01**	51.54	

“The average relative direct sum for the first order is 36.06 and 65.42 for the relative indirect passive sum. The factors that exceed the average by two-third of the standard deviation for either passive or active sum have an adverse effect on the other. F1 with maximum relative active sum has the lowest relative passive sum. The relative active sum for the following factors (factors F11, F12, F14 and F18) falls below the average less the two third of the standard deviation (23.33) but have high values which exceed the 79.31 average by two-third of the standard deviation for relative passive sum revealing the relationship that exists in the system. Indicating that factor with a high

degree of direct impact on the system has less influence on other factors" (Epizitone and Olugbara, 2020).

Table 5.5 present the indirect relationship based on equations 5.9 and 5.10 of the factor in the system with an average of 32.07 for the indirect AS and 62.51 for the indirect PS. The indirect AS and PS reveal the same insight but with lesser of the "average by two-third of the deviation". F1 have the strongest impact which exerts the most influence but in turn a reduced influence on other factors with a value of 100 to 5.86.

Table 5- 5: indirect active and passive sum results

CSFs	iAS'(c)	Ranking by iAS'(c)	iPS'(c)	Ranking by iPS'(c)
F1	100.00	1	5.86	20
F2	36.01	7	69.06	9
F3	41.81	4	64.65	11
F4	41.86	3	25.91	19
F5	34.15	10	53.47	15
F6	19.16	16	78.44	5
F7	37.89	5	53.64	14
F8	27.67	13	69.87	8
F9	34.78	9	52.30	16
F10	30.48	12	67.77	10
F11	8.54	19	85.56	3

F12	13.67	17	92.00	2
F13	31.73	11	79.04	4
F14	12.76	18	100.00	1
F15	35.52	8	57.91	12
F16	36.12	6	48.61	17
F17	43.28	2	45.20	18
F18	5.79	20	74.65	6
F19	26.58	14	54.86	13
F20	23.68	15	71.36	7
Average	32.07		**62.51**	
STD DEV	19.55		21.85	
AVG+2/3std Dev	45.11		**77.08**	
AVG-2/3std Dev	19.04		**47.94**	

The impact and significance of these factors can be identified from the table with F1 across the table revealed to be less significant but has the strongest impact on the system (Epizitone and Olugbara, 2020b). These factors “F4”, “F8”, “F9” and “F13” are vastly influential on “F1”. While on the “F14” the utmost weighty impact comes from “F1”, “F3”, “F4”, “F5”, “F7”, “F10” and “F19” as can be seen on the tables. F1 and F14 are directly percentiles to the system which implies their deficiency to be sensitive to higher levels of CSFs in the system. The CSFs with low level affect higher level as explained indicating the changes that necessitate a good system collaboration and high-performance network.

5.7.2. Criticality, Integration and Stability

The classification of critical success factor can be determined by the “criticality”, “integration” and “stability” for the provisional disposition of the system of the factors (Thompson, Olugbara and Singh 2018). “The state of the system can be significantly altered as a result of changes in any of the factors deemed critical in the system” (Epizitone and Olugbara, 2020b). Table 5.6 convey the figure for the “criticality”, “integration” and “stability” base on equation 5.11, 5.12 and 5 13.

Table 5- 6: CSFs Classifications

CSFs	Classification		
	Critical	Integration	Stability
	C(c)	I(c)	S(c)
“F1	24.22	52.93	88.92
F2	49.87	52.53	52.67
F3	51.99	53.23	49.22
F4	32.93	33.88	68.00
F5	42.73	43.81	58.32
F6	38.77	48.80	69.20
F7	45.08	45.76	55.59
F8	43.97	48.77	60.36
F9	42.65	43.54	58.23
F10	45.45	49.12	57.95

F11	27.03	47.05	84.47
F12	35.46	52.83	76.20
F13	50.08	55.39	54.71
F14	35.73	56.38	77.36
F15	45.35	46.71	55.97
F16	41.90	42.37	58.55
F17	44.23	44.24	55.78
F18	20.79	40.22	89.25
F19	38.19	40.72	64.19
F20	41.11	47.52	64.44
Average	39.88	47.29	64.97
STD DEV	8.46	5.70	12.16
AVG+2/3std Dev	45.52	51.09	73.08
AVG-2/3std Dev	34.24	43.49	56.86"

Source: Author (Epizitone and Olugbara, 2020b).

There are substantial variations in the system holistically when there are any variations in any of the critical factors bases on their “criticality”. An elevated level of “criticality” was attained for F2 “Interdepartmental communication and cooperation throughout the institution”, F3 “Commitment to business process reengineering to do away with redundant processes” and F13 “Understanding the institutional culture-norms, values & beliefs”. “These factors have an elevated degree of criticality C(c)

when looking at the average by the standard deviation. F3 has the highest of 51.99, follow by F13 with 50.08 and 49.87 for F2 as indicated in Figure 5.1 and 5.2 (Epizitone and Olugbara, 2020b). These factors require early updates for remedial measures should there be any changes in them. A low level of criticality was attained for the "F1", "F4", "F11" and "F18" which is below 34.24. Therefore variations in these factors exert trifling impacts on the system. Figure 5.1 convey the contour lines of the "criticality" in similarity to the system "stability". However, the AS and PS present inverse reliance. "This implies that factors with high criticality will have low stability as in the case of F2, F3 and F13" (Epizitone and Olugbara, 2020b).

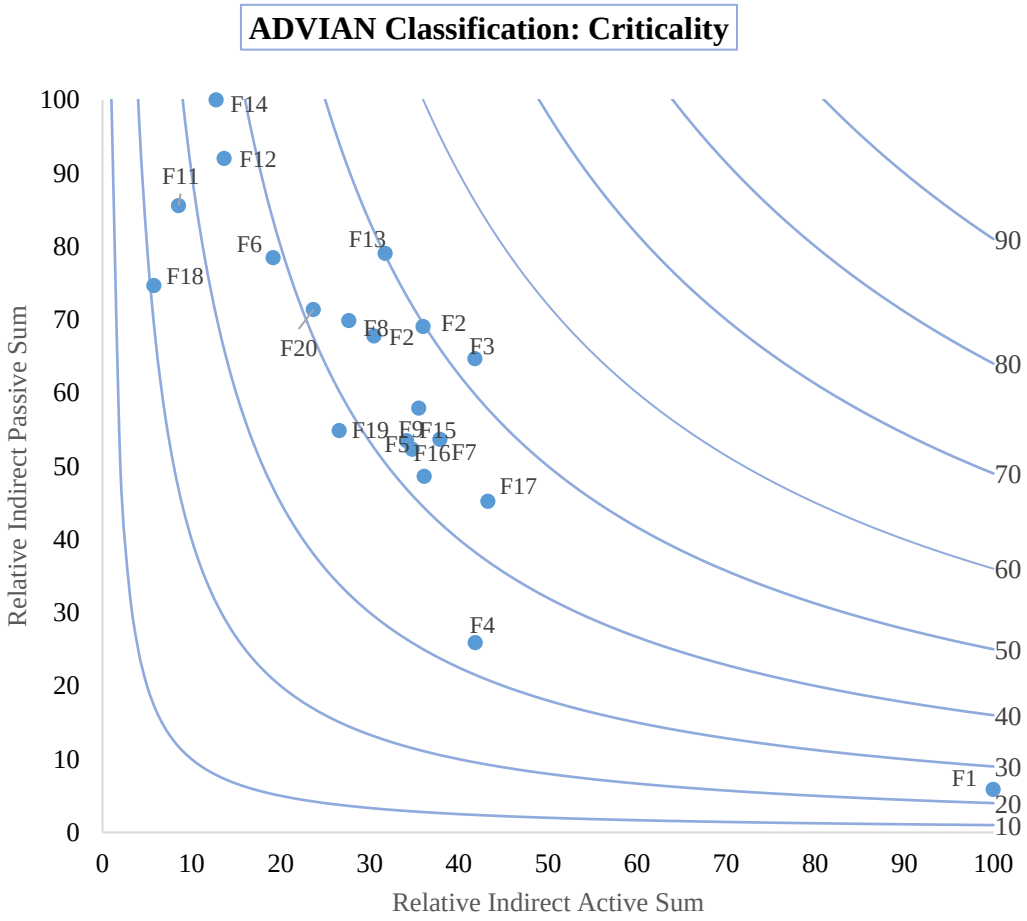


Figure 5- 1: Criticality of Critical Success Factors

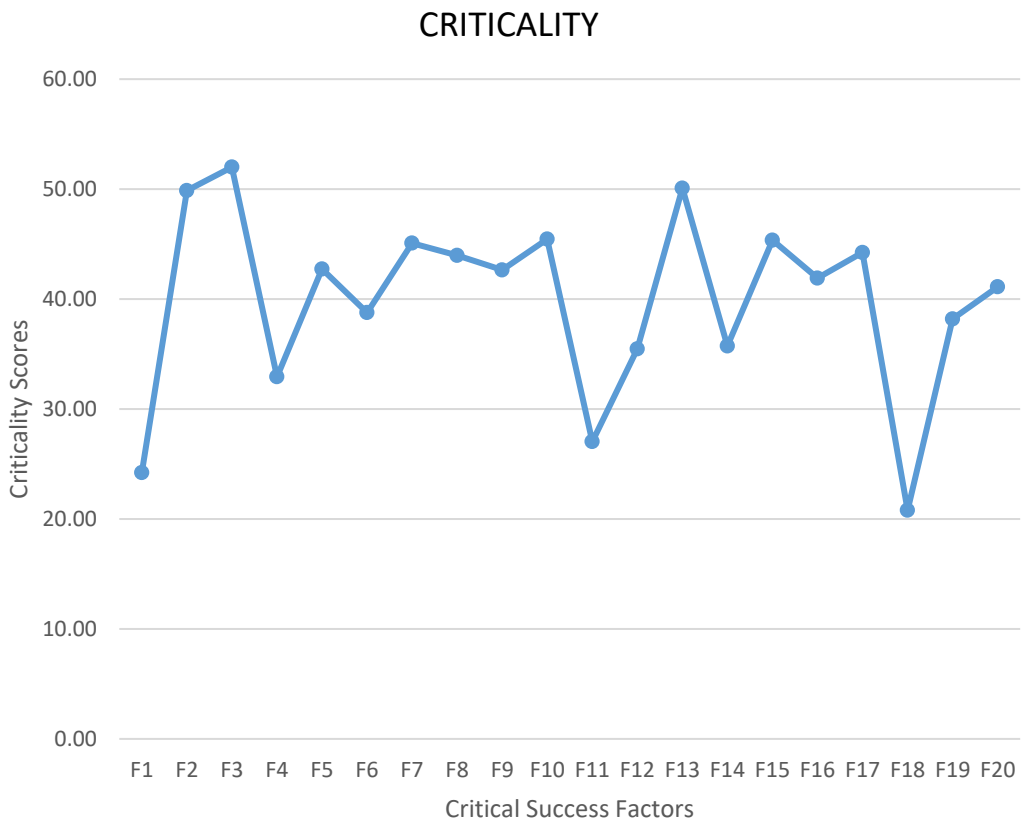


Figure 5- 2: System Criticality

The connection between the factors in the system is ascertained by the degree of "integration". A great level of "integration" I(c), for any factor, signposts a stout link with the remnants of the system. An elevated value of "integration" was attained for F13 "Understanding the institutional culture- norms, values & beliefs" 55.39 and F14 "User involvement and participation throughout implementation" 56.38. Other factors with elevated "integration" also include "F1 (52.93)", "F2 (52.53)", "F3(53.23)" and "F12(52.83)" beyond the 51.09 marks (Figure 5.4). This shows the subsistence of a mutual link and probable feedback loops amid these factors. This feedback loop

sturdily reinforces each other mutual in an indirect connection in diverse levels which confirms the incidence of a reciprocated link and feedback loop between the factors (figure 5.3). As illustrated by the contour line in the “integration” system grid, elevated “integration” factor “F14”, “F13” and “F1” has elevated PS and AS as well as a low “integration” factor with a little PS and AS (F4).

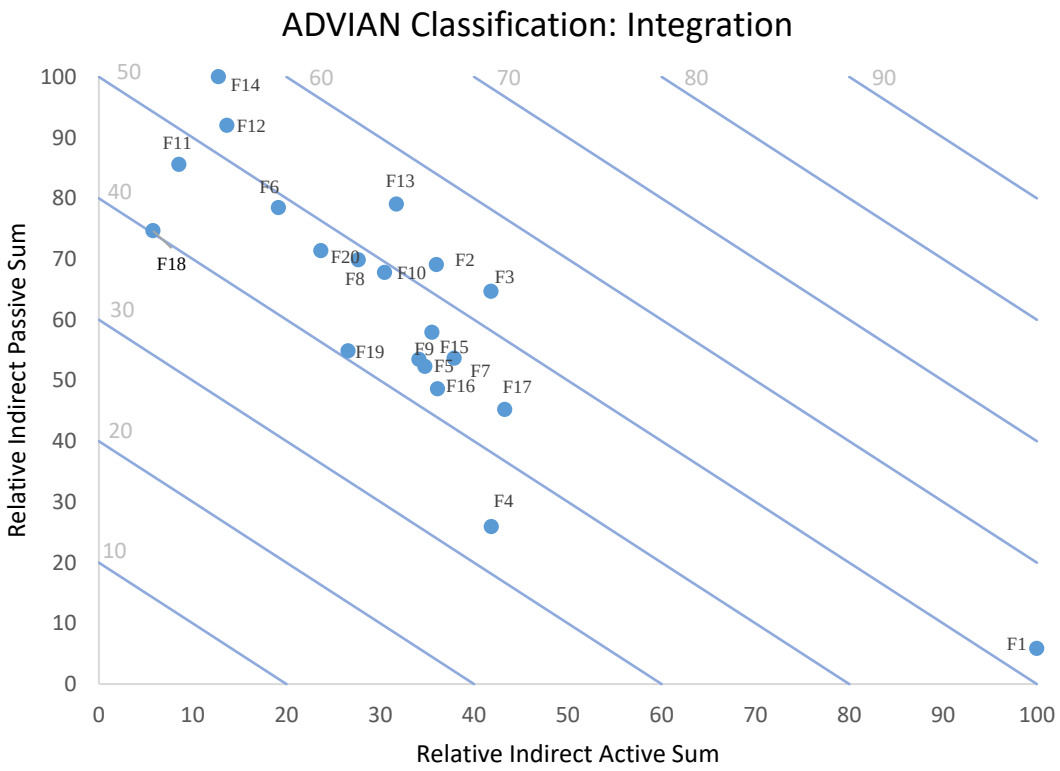


Figure 5- 3 Integration of Critical Success Factors

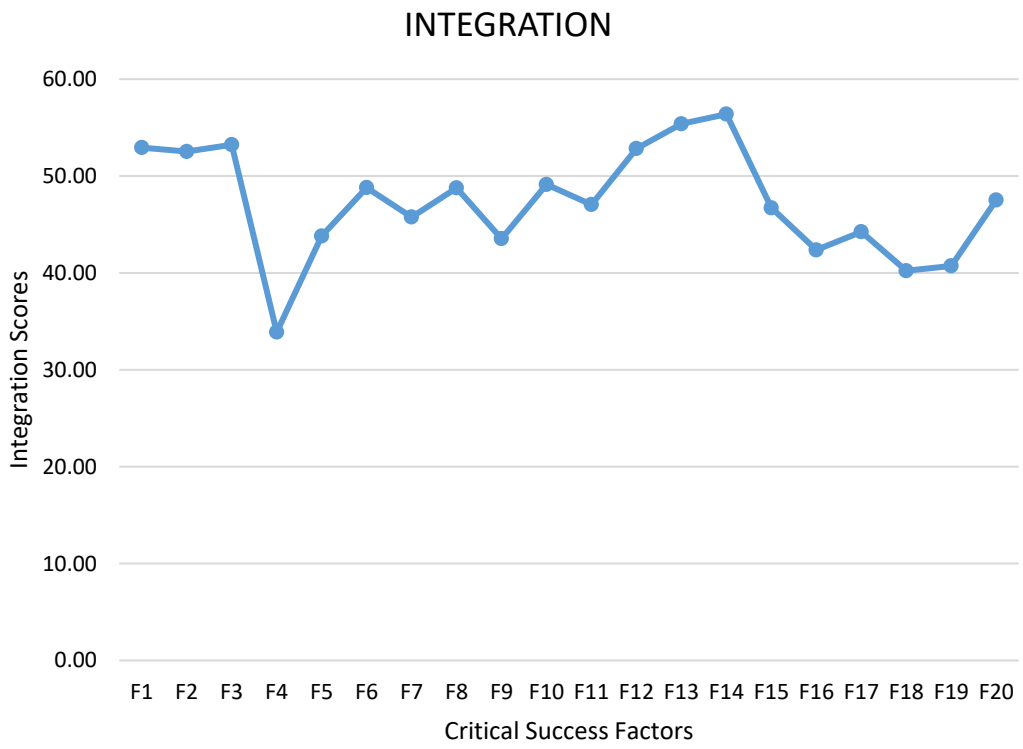


Figure 5- 4 System Integration.

The determination of system “stability” is constructed on the dispersal of the factors towards PS and AS axis (Linss and Fried, 2009; Fried, 2010; Linss and Fried, 2010; Guertler and Spinler, 2015; Thompson, Olugbara and Singh, 2018). Factors policed by the system are allied adjacent to the PS axis with minimal AS axis. But factors that regulate the systems are close to the AS axis with little PS (Linss and Fried 2010). “Stability” level diminishes feedback loops ensuring the nonexistence of uninhibited feedback loops (Linss and Fried, 2009; Guertler and Spinler, 2015; Thompson, Olugbara and Singh, 2018; Epizitone and Olugbara, 2020b).

A high stability S(c), of 73.08 of the “average by two-thirds” of the “standard deviation” was attained. Factors F1 “Top management support and commitment”, F11 “Minimum level of customization to utilize ERP functionalities to maximum”, F12 “Package selection (carefully and professional selected”, F14 “User involvement and participation throughout implementation” and F18 “Monitoring management especially evaluation of performance metrics - fast effects” contribute greatly to the system “stability”. “F18 (89.26), F1 (88.92) and F 11(84.47) are the factors with high calculated values followed by the F12 (76.20) and F14 (77.36). The combinations of the factors with high passive sum and low active sum couple with their different integration levels and high stability indicate their independent attributes within the system” (Epizitone and Olugbara, 2020b). Therefore, the system can barely modify these factors in Figure 5.6. Figure 5.5 illustrates the contour line for the system “stability” which correspondingly position, “F4” and “F6” beyond the system “stability” of 64.97.

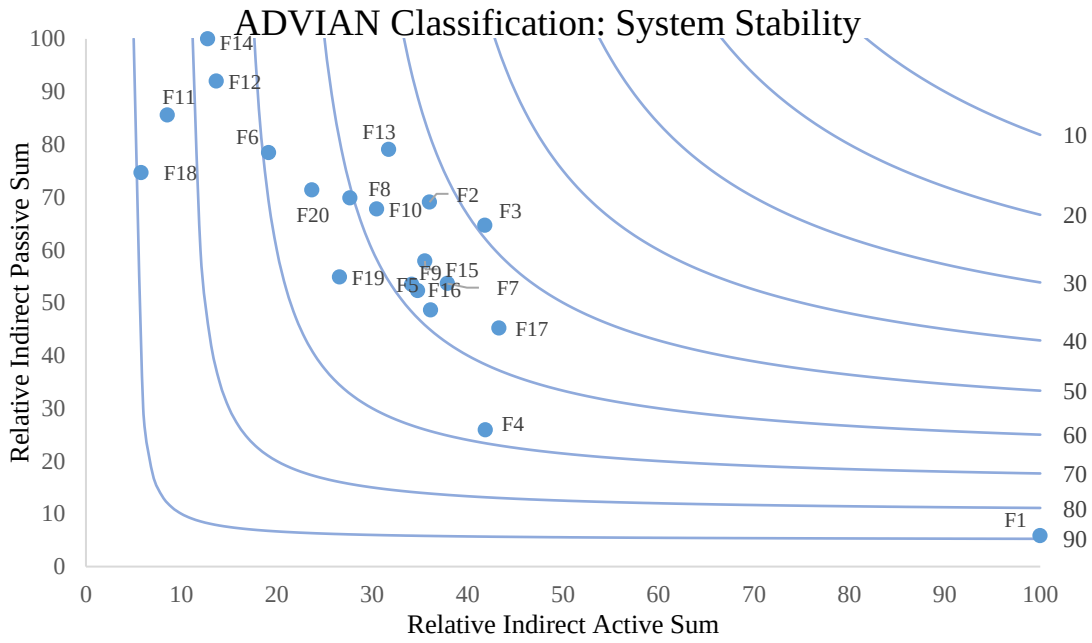


Figure 5- 5: Stability of Critical Success Factors

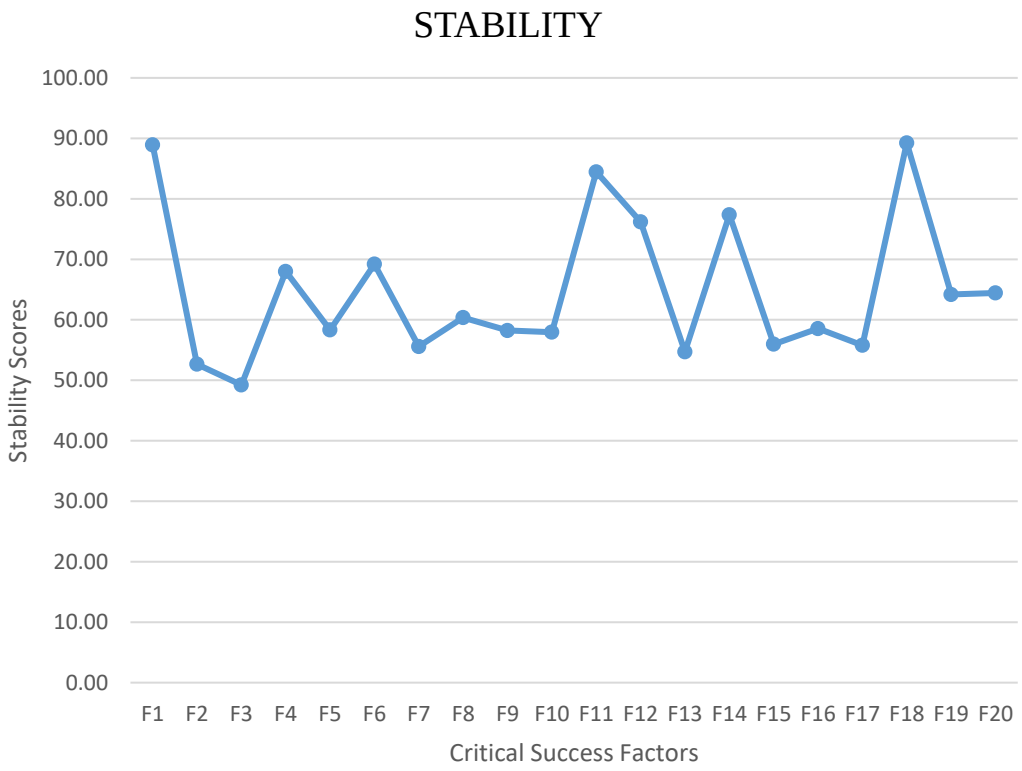


Figure 5- 6: System stability

5.7.3. Precarious, Driving and Driven

"Precarious", "driving" and "driven" are indispensable measurement for the ranking of the CSFs. Table 5.7 shows the values for the "precarious", "driving" and "driven" based on equation 5.14, 5.15 and 5.16.

Table 5- 7: CSFs Ranking

CSFs	Precarious P(c)	"Precarious Ranking"	"Driving" D(c)	"Driving" Ranking	"Driven" T(c)	"Driven ranking"
"F1	49.21	1	87.05	1	21.08	20
F2	42.37	4	42.49	10	58.84	10
F3	46.63	2	44.80	6	55.71	13
F4	37.13	12	52.98	2	41.68	19
F5	38.20	10	44.22	8	55.34	14
F6	27.26	16	34.25	16	69.30	5
F7	41.33	5	45.62	5	54.27	16
F8	34.88	13	39.37	14	62.57	8
F9	38.51	9	44.66	7	54.77	15
F10	37.22	11	40.78	11	60.80	9
F11	15.20	19	24.97	19	79.01	2
F12	22.01	17	29.70	17	77.06	3
F13	39.87	7	39.80	13	62.81	7

F14	21.35	18	28.64	18	80.17	1
F15	40.14	6	44.06	9	56.26	12
F16	38.90	8	45.81	4	53.14	17
F17	43.75	3	49.13	3	50.21	18
F18	10.97	20	21.42	20	76.89	4
F19	31.86	14	40.54	12	58.23	11
F20	31.20	15	37.34	15	64.83	6
Average	34.40		41.88		59.65	
STD DEV	10.28		13.36		13.72	
AVG+2/3std Dev	41.25		50.79		68.80	
AVG-2/3std Dev	27.55		32.97		50.50”	

Source: Author (Epizitone and Olugbara, 2020b)

Precarious impact CSFs apply extreme influence on the system and are exaggerated by peripheral might. The following factors “F1 (49.21)”, “F2 (42.37)”, “F3 (46.63)” and “F17 (43.75)” have elevated “precarious” value beyond the “average by two third of the standard deviation” of 41.40. Due to these factors having a stout influence on the system and invulnerability to exterior forces. They are not idyllic to necessitate intervening actions Figure 5.8. Figure 5.7 convey the contour line for obtaining the most “precarious” factors as well as the least “precarious” factors “F18, F11 and F14”.

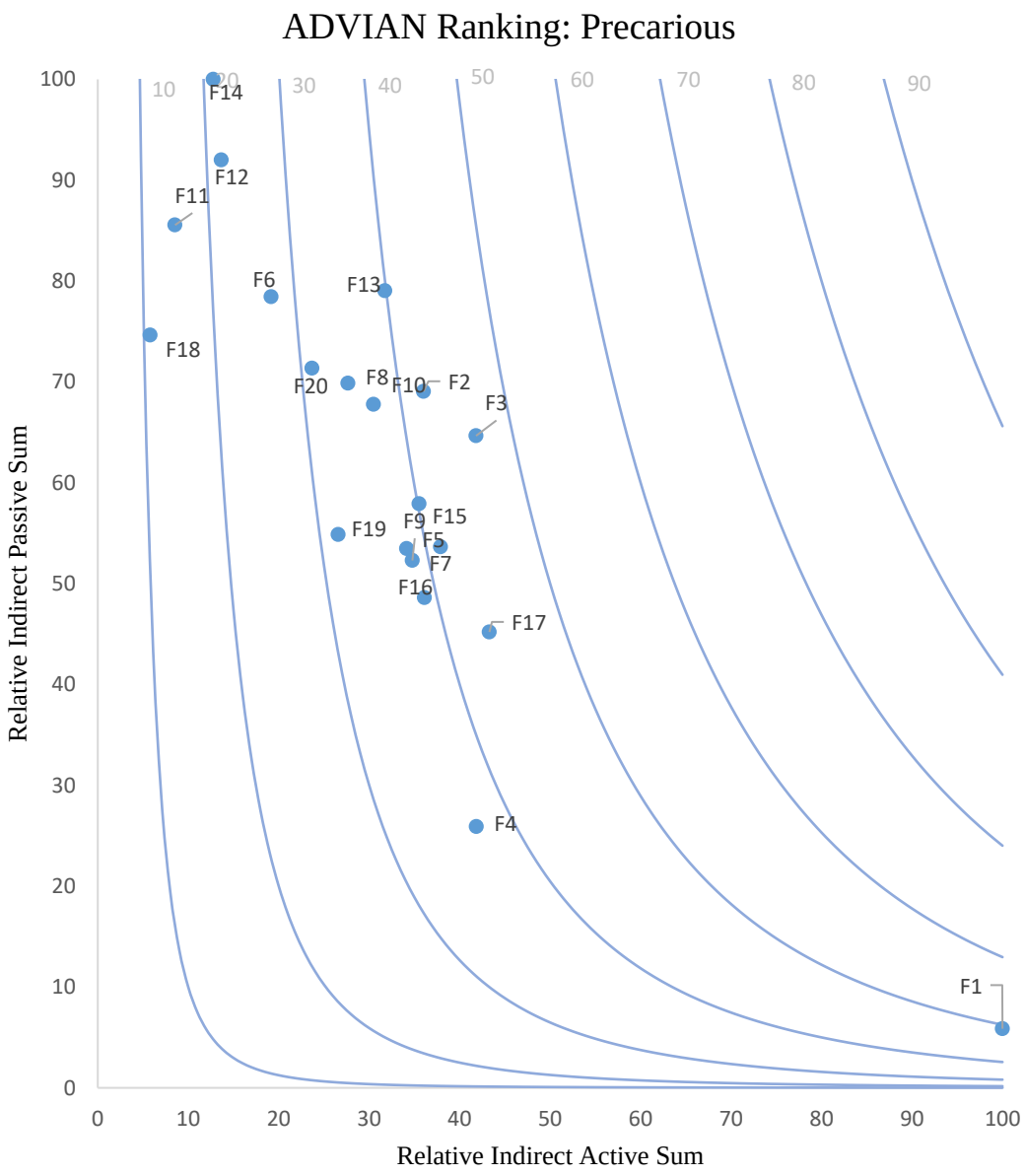


Figure 5- 7: Precarious ranking of Critical Success Factors

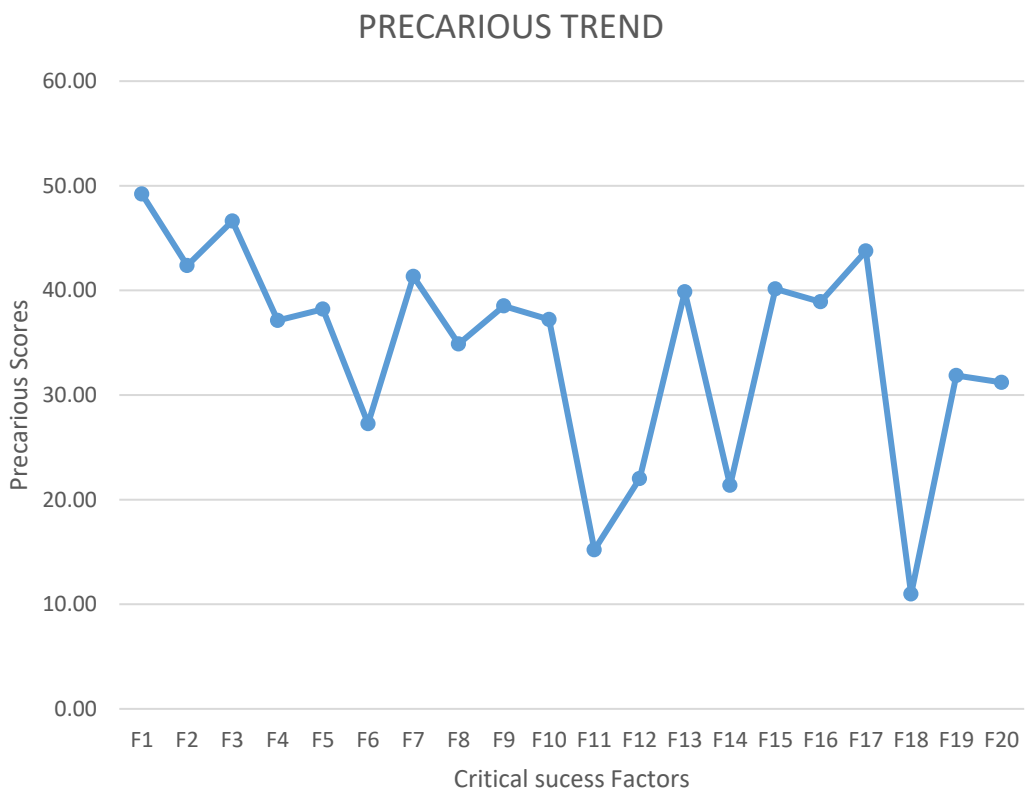


Figure 5- 8 Precarious CSFs

Elevated driving ranking for CSFs are indispensable for enactment accomplishment due to these factors posing a colossal influence on other factors in the system and not generating grand feedback. “F1 (87.05)”, “F4 (52.98)” and “F17 (49.13)” are driver factors with terrific attributes to drive a successful ERP system implementation (Figure 5.10). These factors are uncritical with peak AS. However, they serve as good commencement angle for intrusion activities due to their aptness for outer activities which depends on their aptitude to prompt other factors starved of triggering robust feedback” (Epizitone and Olugbara, 2020). Figure 5.9 flaunts contours lines for “driving” factors.

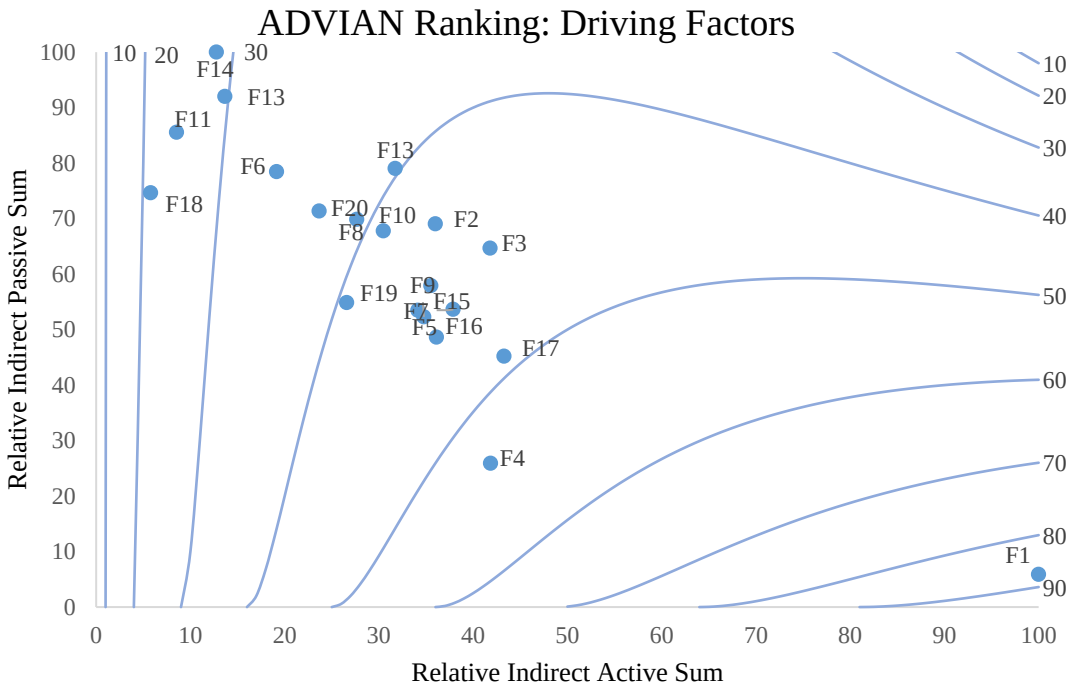


Figure 5- 9: Driving ranking of Critical Success Factors

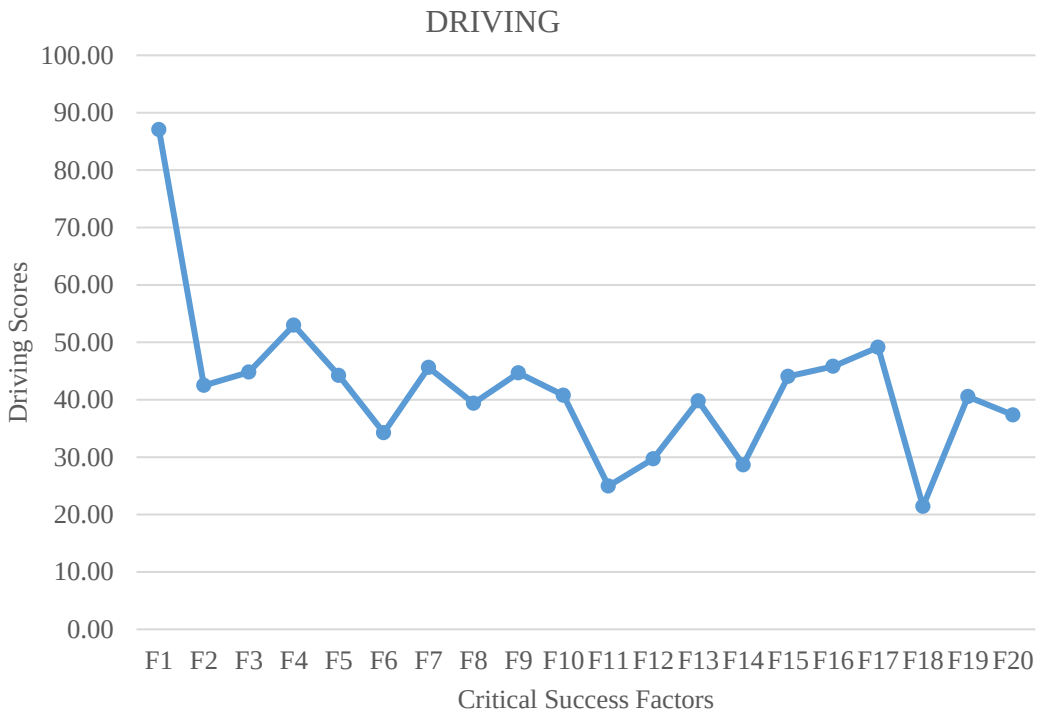


Figure 5- 10: Driving CSFs

Driven bearing factors exist as “non-critical” factors with more PS which are further reactive in nature. They are not judiciously reformed by superseding activities due to internal systems impact guiding them. “Nonetheless, they indicate the success of external actions taken on driving factors” (Epizitone and Olugbara, 2020b). Although not judiciously exaggerated by peripheral variations made to the system; “F6”, “F11”, “F12”, “F14”, and “F18” are virtuous indicators of accomplishment of peripheral intervention on ERP enactment accomplishment by “driving” factors (Figure 5.12). Present the contour lines for the “driven” impact factors ranking (Figure 5.11).

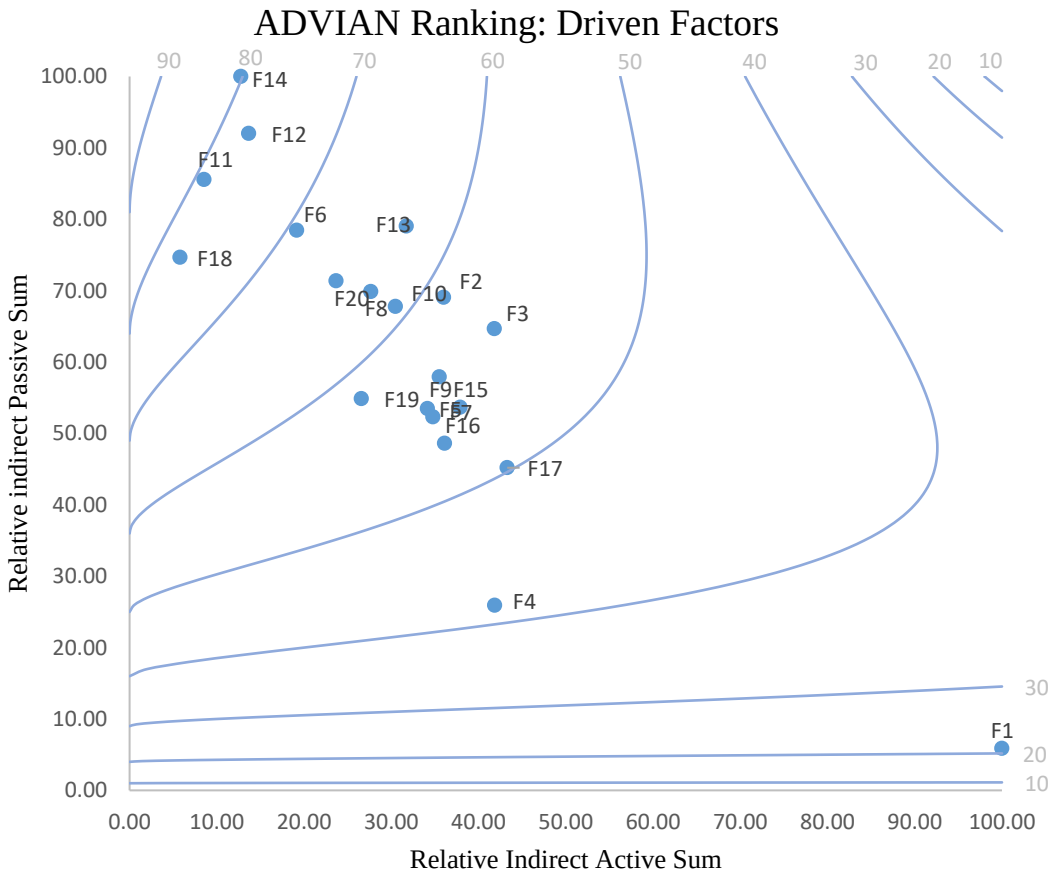


Figure 5- 11: Driven ranking of Critical Success Factors

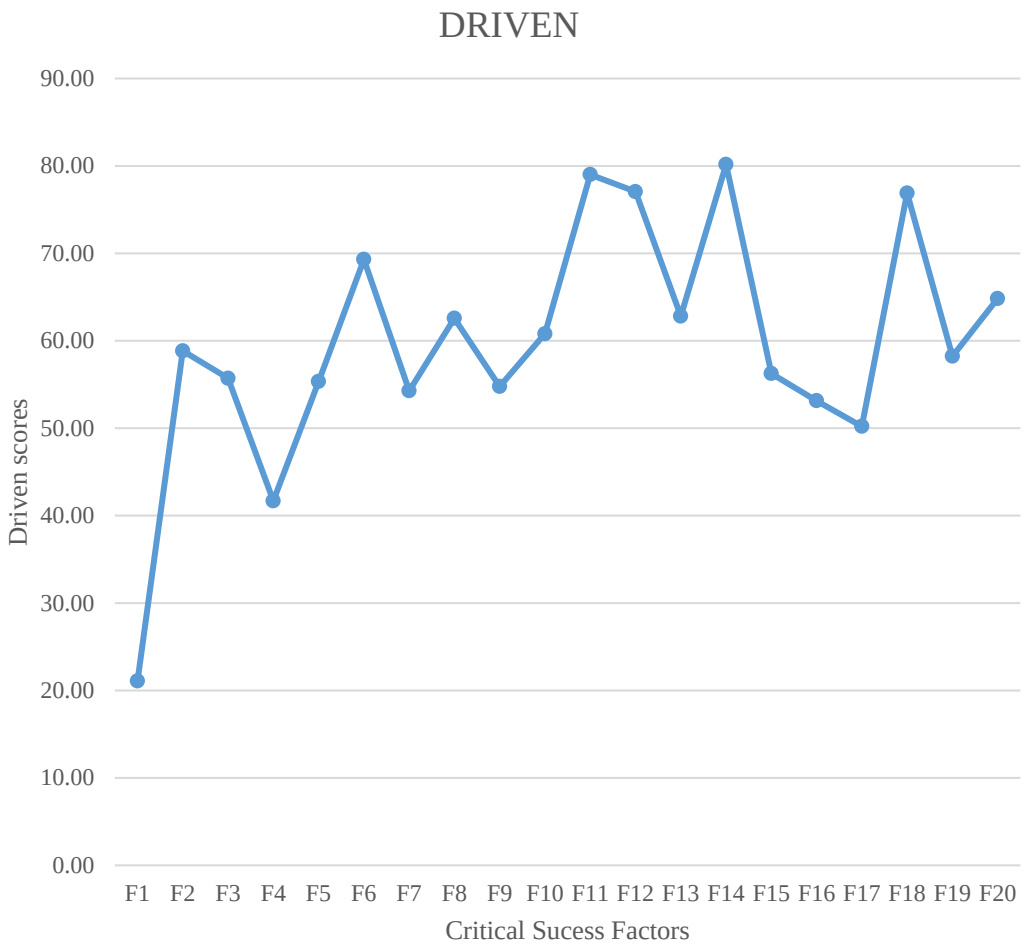


Figure 5- 12: Driven CSFs

5.8. Chapter Summary

The findings and results presented in this chapter fulfil the study objective presented at the beginning of this chapter. The application of ADVIAN explored the worth of the CSFs in a financial system arbitrated by an efficacious enactment using the equation 5.1 to 5.13 which looks at aspect such as their criticality, integration and stability to satisfies Obj2: “To explore the significance of each CSFs in financial sub-system mediated by successful implementation” and RQ2: “What are the significances

of each factor identified above in the financial system such as salary sub-system?" The ranking of the CSFs using the precarious, driving and driven aspect provides a model of CSFs that satisfied the Obj3: "To investigate an effective model that when adopted would support financial functions" and RQ3: "How can these factors be structure into a comprehensive model to aid financial functions?" The following chapter summarized the findings and discussion presented in this chapter to build a satisfactory response to the last objective which provides a general recommendation and henceforward, answered the main research question for the study.

CHAPTER SIX

INTERPRETATION AND DISCUSSION OF ADVIAN RESULTS

6.1. Introduction

This chapter concludes this study by presenting the study implication, contribution, recommendation, conclusion, and future research direction. In accordance with the main study objective to “identify critical success factors for ERP implementation to support financial functions” with the study research question: “What are the critical success factors for ERP implementation to support financial functions?” This chapter presents a final deliberation which satisfied; Objective 4: “To give a general recommendation to management for the efficacious implementation of ERP System that supports significant financial functions” and Research Question 4: “What recommendation can be made to management for a successful ERP implementation that would support financial functions?”

6.2. Interpretation and Discussion

In the ascertainment of CSFs for ERP enactment for the financial system, 205 CSF were aggregated from literature Appendix C and D. 20 top CSFs were further subject to expert opinion and analyzed using ADVIAN. Exploring these factors conceded valued insight into the efficacious ERP enactment that aid financial functions. The

output of this study presents the contribution of the individual factors to the discourse of efficacious ERP system enactment to aid financial functions.

“Top Management support and commitment remains highly relevant in the implementation of an ERP financial system. Given that these factors have been cited by many authors is not a coincidence. The support can range from authorizing, commissioning, and making available resource needed for the implementation of a financial system. A success implemented financial system is an asset to top management who rely on most output such as reports to make crucial decisions for that organization” (Epizitone and Olugbara, 2019, 2020b). Despite this, authors have reported hefty incompetence of these systems when it comes to reporting necessitating the demand for interest to be afforded to them in terms of implementation (Arnold, 2018).

To support the reports in this study, “top management support and commitment” F1 present a high active sum (100), stability (88.92) and driving (87.05). “Despite the low criticality for this factor, any changes presented to it would need intervening activities instituted as it has a great impact on other factors in the system” (Epizitone and Olugbara, 2020b). Hence, mirroring the preceding and recent researches for ERP implementation progress (Abdelghaffar and Azim, 2010; Leyh, 2014, 2016; Epizitone and Olugbara, 2020b).

“Interdepartmental communication and cooperation (F2), stands as a crucial factor for consideration within the implementation of a financial system efficacious implementation. The need for open and fluent communication and cooperation between organization internal stakeholder specifically top management and system

user cannot be overlooked" (Epizitone and Olugbara, 2019, 2020b). Failure and drawback of ERP financial systems are mostly caused by improper communication and cooperation

(Dezdar and Ainin, 2011; Belfo and Trigo, 2013; Trigo, Belfo and Estébanez, 2014; Epizitone and Olugbara, 2019)

Interdepartmental communication and cooperation throughout the institution present a high passive sum of 75.71 and active sum of 39.37 explaining the high criticality (49.87) and precarious ranking (42.37) to the system. Making it of great influence due to the system and strongly influenced by the system. An elevated driving figure of 42.49 above average is an obvious indication that the mention of this factor in other literature have been a good call that indicates the consistent influence it has on other factors with the absence of strong feedback. F2 is, therefore, suitable for an affluent ERP implementation for financial systems.

"Business Process Reengineering (F3) refers to restructuring of business process in an organization. Obligation to business process reengineering to scrap redundant processes is also crucial to financial system implementation where functions have been highly automated" (Epiiztone and Olugbara, 2019, 2020b). Authors highlight the huge job consolidation along with automation by ERP system (Chen et al., 2012; Epizitone and Olugbara, 2019). Identifying the additional responsibilities that must be taken on and aligning with the system's enforcement (Chan et al, 2012; Dezdar and sulaiman, 2009; Epizitone and Olugbara, 2019).

F3 also present a high passive sum value of 71.42 which indicate the impact other factors exert on it. There is also a lofty criticality value of 51.99 and 53.23 for

assimilation for this factor. These values for this factor indicate its contribution to successful implementation for financial function. “This study converges previous studies that had cited these factors as critical, given that they are classified as an important integrator in the system with a high precarious value of 46.63 indications of their strong influence on the system” (Epizitone and Olugbara, 2020b). Additionally, a driven factor (44.80) beyond the average make this factor critical and one of most organizational resource for progress warranting intervention activities should there be any alterations to it (AlSudairi, 2013; Thompson, Olugbara and Singh, 2018; Epizitone and Olugbara, 2020b).

“Project Management (F4) entails a broader scope of implementation. For the financial system to successful a good project management must be instituted” (Epizitone and Olugbara, 2019, 2020b). To facilitate the financial system's adoption, develop a team, address disputes, and carry out the implementation's targets (Sykes, Venkatesh and Johnson, 2014; Epizitone and Olugbara, 2019, 2020b). Given that ERP project can tend to be complex attention needs to be given to the financial system implementation (Fui-Hoon Nah, Lee-Shang Lau and Kuang, 2001; Somers and Nelson, 2004).

“Implementation Project Management from initiation to closing was identified in this study to be a factor with a high stability value of 68.00 which implies its significant contribution to ERP system implementation stability” (Epizitone and Olugbara, 2020b). The driving value of 52.98 was found for this study which echoes the reference in preceding studies as critical and emphasizes its connotation in ERP financial system accomplishment due to being active ((Rabaa'i, 2009).

“Change Management crosses through diverse aspect in the implementation of an ERP system. Change spans a great length ranging from cultural, organizational and structural” (Epizitone and Olugbara, 2019, 2020b). For effective enactment, a secure and efficacious environment is needed (Finney and Corbett, 2007; Moon, 2007; Dezdar and Sulaiman, 2009; Shaul and Tauber, 2013; Epizitone and Olugbara, 2019). “Change management program to ensure awareness and readiness for any changes that may happen” (F5) was unearthed to be crucial to ERP system implementation presenting values higher than the average for active sum of 39.37 and ranked 44.22 for driving. It depicts “F5” as active in the enactment bearing on other factors.

“Project teams play a vital role in the implementation indicating that the formation, participation, skills and involvement is asserted by authors (Finney and Corbett, 2007; Moon, 2007; Dezdar and Sulaiman, 2009; Shaul and Tauber, 2013; Saade and Nijher, 2016). Highly relevant for the triumph of financial system implementation” (Epizitone and Olugbara, 2019, 2020b)

F6: “Project team competence (formulation, composition and involvement)” emerge to tally with preceding studies as influential on the system due to other factors significant impact on it like “F1”, “F4”, “F7” and “F17”. “Project team competence which consists of the formulation, composition and involvement” presents a little precarious value of “27.26” signaling its use as intervention factor for enactment measurement since it is aptly influenced by outer action. “Rightly deploying a project team with competency to execute tasks can mediate a successful ERP financial system which supports its presence in previous literature given that it has a high driven ranking

of 69.30. Hence a good indicator of the success of intervention that requires management attention" (Epizitone and Olugbara, 2020b).

F7: "Education and training for stakeholders" including end users, technical and IT staffs are deemed in literature to be crucial in the enactment of ERP financial system. Many implementation issues can be tailback to education deficiency reported in literature like failures, employee uneasiness and training limitation ((Finney and Corbett, 2007; Moon, 2007; Al-Fawaz, Eldabi and Naseer, 2010; AlSudairi, 2013; Alias *et al.*, 2014). The precarious value of 41.33 implies that "F7" is a precarious impact factor with excessive activities which requires monitoring engagement during enactment if any issues are influencing it (Epizitone and Olugbara, 2020b).

"Project champion presence to lead the financial system enactment; authorized to use internal and external resources to complete ERP financial system implementation" (F8), from findings the worth of "ERP project champion" is alluded in rapports of a precarious figure above the average of 34.88 which indicate its incumbrance on the system. "This study deemed "F8" significant due to the driven nature with a value of 62.57 which make it a good indicator of success and their integration of 48.77 to the system requires that it be monitored"(Epizitone and Olugbara, 2020b).

"Project mission and goals for the system with clear objective agreed upon" (F9), from the finding was position 9th rank to be "precarious" (38.51) and 7th in "driving" (44.66). "This supports the listing of F9 as important to ERP financial system implementations in accordance with previous literature given that they will require corrective actions and intervention if there is any deviation for the goals and mission of the project implementation which adversely affect implementation" (Epizitone and

Olugbara, 2020b). Hence, echoing the necessity for an obvious future picture for ERP financial system implementation as echoed in previous studies (ALdayel, Aldayel and Al-Mudimigh, 2011; Al-Hadi and Al-Shaibany, 2017; Thompson, Olugbara and Singh, 2018; Epizitone and Olugbara, 2020b).

F10: “ERP Expert consultant” use to chaperon ERP financial enactment process is relevant with a figure of 45.45 beyond average and the minimal threshold of 34.21. “A driven value of 60.80 for this factor coupled with a high passive sum of 74.28” (Epizitone and Olugbara, 2020b) supports erstwhile studies to highlight its significance in financial system enactment to be crucial as success indicators. “F10” appearance in a feedback loop is extremely probably as preceding studies associate it insertion in implementation to mitigate failure and knowledge transfer to the enactment team (Al-Mashari, Al-Mudimigh and Zairi, 2003; Rabaa'i, 2009).

F11: “Minimum level of customization” to utilize ERP functionalities to maximum” is required for financial system enactment satisfaction. “A high passive sum value of 82.85 and 85.56 signify the high influence on the financial system implementation. This is supported by the high stability value of 84.47 which indicate that it contributes highly to the stability of the system which is also an indication of the strong impact other factors in the system have on it. A driven value of 79.01 further indicates that this factor is strongly impacted by other factors in the financial system hence, an indication of the success of intervention activities on the system. A very low precarious (15.20) also attest to the stability in the system” (Epizitone and Olugbara 2020b). Aforementioned studies posit that a marginal level of customization to be set up to counteract financial system setbacks and discontent incidentally denote the demand

for vanilla financial ERP systems (Akkermans and van Helden, 2002; Rabaa'i, 2009; Ziemba and Oblak, 2013; Reitsma and Hilletofth, 2018a).

F12: “Package selection (carefully and professional selected)” of ERP financial system is extremely substantial with a driven nature (77.06) which the success of measures of intervention as they have the most influence on the system and are channelled by the system internal impacts. F12 contributes ominously to ERP financial system enactment stability of with a worth of 76.20. Erstwhile studies reveal the concentrate on opt for the best package to be critical to an unbeaten implementation. (Al-Mashari, Al-Mudimigh and Zairi, 2003; Somers and Nelson, 2004; Rabaa'i, 2009; Saade and Nijher, 2016). “The integration of 52.83 in this study substantiates previous studies to postulate the right package selection of ERP financial systems to be crucial for success” (Epizitone and Olugbara, 2020b).

F13: “Understanding the institutional culture which includes the norms, values and beliefs” is stared as valuable in terms of “criticality” (50.08) and “integration” (55.39). The elevated PS for this factor leads it to be rank as driven (62.81) which align with preceding studies (Rabaa'i, 2009; Olugbara, Kalema and Kekwaletswe, 2014; Venkatraman and Fahd, 2016; Al-Hadi and Al-Shaibany, 2017; Aremu, Shahzad and Hassan, 2018; Loonam *et al.*, 2018; Thompson, Olugbara and Singh, 2018) that consider this factor to be highly critical for ERP implementation success” Epizitone and Olugbara, 2020b). Therefore, in a financial ERP system, this factor must be monitored for intervention to be instituted.

F14: “User involvement and participation throughout ERP financial implementation” is found with a 100 per cent PS regardless of the low AS. F14’ stability (77.36) and

driven (80.17) is elevated presenting it as a foremost CSF in the financial system enactment. “An integration of 56.38 supports the stability and driven measurement of this factor with a low precarious impact of 21.35” (Epizitone and Olugbara, 2020b). Authors identify F14 to be highly prominent and driven in-kind necessary for monitoring ERP financial system due to its dependency on other factors (Thompson, Olugbara and Singh, 2018; Epizitone and Ougbara, 2020b).

F15: “ERP Vendor support and partnership for a financial system implementation” emerged with 45.35 criticality. “However, the low precarious measurement indicates that they are relevant for intervention due to their high reactive and driving (44.06) nature within ERP financial system implementation” (Epizitone and Olugbara, 2020b). Authors support F15 as an imperative factor to ERP system implementation realization in terms of user training technical assistance, updates and maintenance ((Reitsma and Hilletofth, 2018a; Thompson, Olugbara and Singh, 2018).

F16: “Business vision and plan for ERP financial implementation” ranking and classification was measured under average. “However, it is reactive with an active sum above the average of 41.73 and 48.61. This indicates that it impacts other factors in the system hence should be monitor and used for interventions due to its driving nature (45.81) and criticality (41.90) above average is also noted by this factor” (Epizitone and Olugbara, 2020b). F16 as “a plan with clear vision and agreed upon objective” is asserted by authors to be substantial to implementation (Finney and Corbett, 2007; Ngai, Law and Wat, 2008; Françoise, Bourgault and Pellerin, 2009; Hanafizadeh *et al.*, 2010; Ahmad, Haleem and Syed, 2012; Shaul and Tauber, 2013; Ram, Wu and

Tagg, 2014; Al-Sabaawi, 2015; Ashja, Moghadam and Bidram, 2015; Denolf *et al.*, 2015; Campos Fernandes Leandro, Mexas and Drumond, 2017).

F17: "Adequate IT Infrastructure for ERP financial system" emerge to be crucial with an elevated driving (49.13), criticality (44.23) above the average and precarious value (43.75) standard deviation indication. F17 is reactive in form and strongly shaping the system therefore apt for intervention. Preceding findings rank the competence of IT infrastructure higher throughout implementation indicating the significant (Hanafizadeh *et al.*, 2010; Campos Fernandes Leandro, Mexas and Drumond, 2017),

F18 "Monitoring management especially evaluation of performance metrics (fast effects)." Is determined as driven in nature (76.89). "Its high passive value indicates its dependency on other factors in the system and as such an enabler of high stability (89.25). The low precarious value of 10.97 implies it could be used for intervention" (Epizitone and Olugbara, 2020b). This endorses aforementioned findings that elevate this F18 as critical for thwarting adverse challenges from ERP system implementation ((Hanafizadeh *et al.*, 2010; Al-Hadi and Al-Shaibany, 2017; Campos Fernandes Leandro, Mexas and Drumond, 2017).

F19: "Allocating and dedicating valuable resources for ERP financial system implementation" appears in this study to refute former study classification and ranking of critical ((Saa *et al.*, 2017; Saxena and McDonagh, 2017). "Both low values for passive and active sum indicate that the role of this factor to be neutral with no significant changes hence the presence could likely be contributing to the system stability (64.19). It is also an indication of this factor being inert in nature" Epizitone and Olugbara, 2020b).

F20: “Data management plan that ensures that data are accurate and efficient migrated to the new system and analyzed properly” is present to be reliant on the other factors in the system due to its high passive value of 71.42 and 71.36. “An integration (47.52) and critically (41.11) above average established this factor to be an important factor in the financial system being driven in nature (64.83) can indicate success and offer stability (64.44) due to its low precarious value (37.34)” (Epizitone and Olugbara, 2020).

6.3. Summary

The study objective was to identify, “CSFs for the ERP financial system implementation that will support financial functions” Hence, probing profoundly into the infantile area of research regarding CSFs in ERP financial system implementation. In summary, this study explores the body of knowledge for CSFs for ERP implementation to deliver a stimulating insight into the mindset regarding CSFs and ERP financial system implementation and adoption in the HEIs. The ADVIAN measurements present 9 factors that prove to be exceedingly significant to the efficacy of the financial ERP’s System in HEI. This includes “F1”, “F3”, “F6”, “F11”, “F12”, “F13”, “F14” and “F18”. While the other factors are vital to the system, the measurement of the above factors is seen to be extremely high for both the ranking and classification measurement. Although only featuring high scores in only some of the ranking measure these 3 factors (F4, F7, and F17) are also considered vital. While each factor has been individually discussed in accordance with the financial system

attainment. These 12 factors are seen to be fundamental crucial to the system's success and can be model for system optimization.

CHAPTER SEVEN

SUMMARY, IMPLICATIONS, LIMITATIONS AND CONCLUSION

7.1 Summary of Contribution

This study conglomerates diverse methods and stump up to IS research and practice. From a researcher's standpoint, our study confers to financial sectors and CSF investigation, identifying 20 CSFs resulting from a systematic literature review. Then further, explored these CSFs via expert opinion in the study.

By answering RQ1; *"what is the minimum set of CSFs of ERP system implementation to support financial functions?"* Using the review literature, we identified CSFs pertinent for the financial system adoption and implementation in HEIs and noted that they are seldom discussed. These findings were presented in Chapter two in a critical review of literature that related to ERPs, CSFs and the implementation of ERPs financial system. From the review, 205 CSFs for ERP implementation was obtained with 20 factors being extracted based on their frequency and later deployed in the fieldwork. Objective 1; *"to identify the minimum set of critical factors for ERP implementation that would support financial function"* was satisfied, and the findings presented in chapter 2.

On this basis, RQ2; "*what are the significance of each factor identified above in the financial system such as salary sub-system?"* This was answered by probing the CSFs through the administration of online data collection tools to expert participants and applying the ADVIAN analysis to the cross impact matrix generation from the expert

contribution to the ERP financial system context in HEIs. This study affords acumens into financial implementation in HEIs from experts to practice/practitioners. The findings were presented in Chapter 4 which detail a framework of the field study and presentation of factors to experts' participants. Chapter 5 presents the findings from ADVIAN for the identified factors and significance indicated for each of the factors in the study in chapter 6 to satisfy objectives 2; "*To explore the significance of each CSFs in salary sub-system mediated by successful implementations".*

In addition, the determination of CSFs in a financial system implementation the ranked and classified factors are structure to a comprehensive model as shown in Figure 7.1 (Epizitone and Olugbara, 2020b). This benefit organization mediate a positive ERP financial implementation by incorporating the identified CSFs that should support financial functions. The ranking provides apt factors that should be designated for system enhancement as well as police the developmental progress. "The factors with the highest driving ranking "√√***" are the best impact factors for interventions changes" (Epizitone and Olugbara, 2020b). "Furthermore, selecting a smaller number of low precarious factors along with the highest driven impact factors as success indicator of intervention activities. Classification of the CSFs for the financial system implementation is also achieved and determined by their integration into the system further contributing toward the stability while proving the critical factors identified" (Epizitone and Olugbara, 2020b). These classifications serve as a good starting point for surveillance with the overhaul for the financial system implementation.

Summary of the Advian analysis										
√√*** higly crucial / √ Above average		Interraction		Classification			Ranking		
	CSF	Highly Active	Highly Passive	Criticality	Integration	Stability	Precarious	Driving	Driven
F1	Top management support and commitment	√√***			√√***	√√***	√√***	√√***	
F2	Interdepartmental communication and cooperation throughout the institution	√	√	√√***	√√***		√√***	√	
F3	Commitment to business process reengineering to do away with redundant processes	√	√	√√***	√√***		√√***	√	
F4	Implementation of project management from initiation to closing	√				√	√	√√***	
F5	Change management program to ensure awareness and readiness for any changes that may happen	√		√			√	√	
F6	Project team competence (formulation, composition and involvement)		√√***		√	√			√√***
F7	Education and training for stakeholders (end users, technical and IT staffs)	√		√			√√***	√	
F8	Project champion presence to lead the implementation (authorized to use internal and external resources to complete implementation)		√	√	√		√		√
F9	Project mission and goals for the system with clear objective agreed upon	√		√			√	√	
F10	ERP Expert consultant use to guide the implementation process		√	√	√				√
F11	Minimum level of customization to utilize ERP functionalities to maximum		√√***			√√***			√√***
F12	Package selection (carefully and professional selected)		√√***		√√***	√√***			√√***
F13	Understanding the institutional culture (norms, values & beliefs)		√√***	√√***	√√***		√		√
F14	User involvement and participation throughout implementation		√√***		√√***	√√***			√√***
F15	ERP Vendor support and partnership	√		√			√	√	
F16	Business vision and plan	√		√			√	√	
F17	Adequate IT infrastructure	√		√			√√***	√	
F18	Monitoring management especially evaluation of performance metrics (fast effects)		√			√√***			√√***
F19	Allocating and dedicating valuable resources								
F20	Data management plan that ensures that data are accurately and efficient migrated to the new system and analysed properly		√	√	√				√

Figure 7- 1: ADVIAN analysis Classification and Model Summary. Source: Author (Epizitone and Olugbara, 2020b).

The most significant measure is the driven and driving critical success factors. Driving CSFs exerting impact on the system imposing consideration as a good starting point for intervening activities. Hence, a key organisational resource for improvement. Nevertheless, a smaller selection of CSFs convened from the elimination of elevated precarious CSFs when possessing elevated driving ranking are an apt enhancement approach. "Furthermore, the driven critical success factors are the most influence in the system which make them noble indicators of triumph for intervening activities setting in motion driving resources. Thereby, making the condition of driven resources a good measurement of success for intervention activities and the state of driving resources enriched by intervention actions" (Epizitone and Olugbara, 2020b)

This directly responded to *RQ3: "How can these factors be structure into a comprehensive model to support financial functions?"* And satisfied objective 3: "To investigate an effective model that when adopted would support financial functions".

The RQ4: "*What recommendation can be made to management for a successful ERP implementation that would support financial functions?"* And Objective 4: "*To give general recommendation to management for an efficacious implementation of ERP System that supports significant financial functions";* Has been achieved in this chapter which presents a final deliberation and highlights factors attributes and contribution in a financial system implementation for management to strategical looked into and implemented for successful financial ERP system implementations.

The prime RQ set forth was: "*What are the critical success factors for ERP implementation to support financial functions?"* This has been realized by tackling the four questions and objectives. In accordance with the objectives set out, it is ostensible

that all factors obtained in the study are extremely pertinent to the financial system implementations. The measures of each of these factors also reveal attributes of each of these success factor which individually or combine can mediate ERP financial system accomplishment. Providing management with knowledge that can be employed to revise ERP implementation strategies and fine-tune it for maximum optimization of the system which intern supports financial functions. In conclusion, it can be seen that the objectives set out have been realized with the presentation of a cluster of CSFs which can be used to determine the efficacious system that supports financial functions.

7.2. Implications

From this study, a clear gap in insights into financial systems implementation can be identified. Hence, it is in the managerial interest to note from this study the identified issues within the system implementation process and employed strategies to mitigate these issues. Academically, the study implications present vast gaps amongst the field of “ERP implementation”, “CSFs” and the “financial sector” investigation. These gaps can be subjugated beyond by both academics and practitioners to grasp what makes an ERP implementation support financial functions. While the study is based on a single HEIs, the output can be oversimplified to other akin organization where their financial management demands reformation and is vital. Subsequently, several HEIs that have a financial ERP system implemented in developing nation like South Africa, can assert that this outcome can be geographically generalized. Therefore, a feasible section for imminent research.

7.3. Limitation

Like many other studies of this nature and before this there are possible limitations that are presented during this study. However, the researcher performed this study with all efforts to mitigate the limitations of the study. While this study contributes to an underserved forte of ERP implementation research that delves deep into the financial sphere it involved only one institution in a developing nation. Therefore, no generalization of the outcome to other developing countries is afforded however, nationally in South Africa HEIs there can be primed from the outcome. Equally, most of the organization ERP implementation is customized to their setting, it is conceivable that the study of loftier organizations would have resulted in poles apart findings. Likewise, evaluation of expert content in the context of the pragmatic inquiry and the ranking of the factors may turn out otherwise. Nonetheless, the utilization of a mixed methods methodology is extremely advantageous here, owing to the minuscule sum of scientific research that guided this subject field. Thus, the elected approaches represent an opposite methodology for unloading a preliminary synopsis and substantiation of implementation and adoption CSFs for the ERP in HEIs.

7.4. Future studies endorsement

Future work from this study with an emphasis on long-term research could be based on replicating the study to include a larger sample that tackles the main limitation of this study.

Conduct a similar study in South African universities and then next moving further to southern Africa and other African countries.

Build on the outcomes and on other outcomes of erstwhile study regarding the outlook of CSFs in an intelligent ERP system to develop a CSFs assortment and enactment framework in footings of design science research to support recipient organization.

Uncovering the linkage between ERP and Big data analytics.

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APPENDIX A

Factors	AS	order1	order2	order3	order4	order5	order6	order7	order8	order9	order10	order11	order12	order13	order14	order15	order16	order17	order18	order19
F1	14.1114	69.452954	300.5383	1292.0865	5559.069	23918.84	102914.35	442804.11	1905229.8	8197531.6	35271085	151759032	652965554.9	2809480335	12088202343	52011268450	2.23786E+11	9.62873E+11	4.1429E+12	1.78254E+13
F2	5.555	25.106656	108.12937	465.23204	2001.6581	8612.41	37056.182	159439.68	686012.65	2951670.3	12699996	54643599.48	235112123.5	1011604490	4352577101	18727603129	80578266820	3.467E+11	1.49173E+12	6.41838E+12
F3	6.5552	29.267384	125.63915	540.23188	2324.4696	10001.43	43032.622	185154.16	796653.03	3427716.8	14748256	63456539.54	273031094.2	1174756439	5054562355	21747997932	93573959683	4.02616E+11	1.73231E+12	7.45353E+12
F4	6.5551	29.217656	125.6665	540.79541	2326.9261	10011.883	43077.586	185347.67	797485.59	3431299	14763669	63522856.46	273316432.5	1175984149	5059844758	21770726247	93671751601	4.03036E+11	1.73412E+12	7.46132E+12
F5	5.5551	23.983601	102.5801	441.20905	1898.4227	8168.318	35145.349	151218.03	650637.83	2799465	12045110	51825856.04	222988367.9	959440248.8	4128132780	17761898428	76423180313	3.28822E+11	1.4148E+12	6.08741E+12
F6	3.3331	13.207801	57.430849	247.61682	1065.2561	4583.3119	19720.437	84850.087	365079.96	1570810.2	6758642	29080051.39	125121198.1	538352356.8	2316340193	9966394355	42881877518	1.84506E+11	7.93862E+11	3.41571E+12
F7	6.333	26.613183	113.78195	489.51952	2106.3952	9063.07	38995.147	167782.37	721908.35	3106116.8	13364524	57502832.04	247414392.1	1064536810	4580326193	19707527094	84794533801	3.64841E+11	1.56978E+12	6.75422E+12
F8	4.1107	19.058416	83.106317	357.53644	1538.0538	6617.7637	28473.947	122513.32	527131.56	2268061.1	9758666.4	41988097.45	180659964.7	777316068.5	3344516708	14390275032	61916274769	2.66404E+11	1.14624E+12	4.93187E+12
F9	5.2217	24.119332	104.50833	449.30912	1933.1693	8317.8057	35788.569	153985.57	662545.58	2850699.8	12265555	52774354.79	227069423.3	976999589.7	4203684427	18086970501	77821850717	3.3484E+11	1.4407E+12	6.19882E+12
F10	4.9997	21.391627	91.572967	393.74152	1694.2582	7289.8247	31365.518	134954.76	580662.7	2498386.7	10749676	46252062.71	199006302.3	856253884.6	3684158272	15851632810	68203981538	2.93458E+11	1.26264E+12	5.43271E+12
F11	1.6665	5.9248186	25.624088	110.36777	474.89435	2043.2854	8791.5343	37826.87	162755.67	700280.22	3013058.6	12964127.88	55780066.91	240001941.7	1032643652	4443101191	19117096340	82254118643	3.5391E+11	1.52275E+12
F12	2.222	9.6032063	41.046823	176.54607	759.6472	3268.5218	14063.281	60509.332	260350.3	1120195.5	4819805.7	20737923.08	89227964.09	383916438.7	1651856942	7107357438	30580450691	1.31577E+11	5.66129E+11	2.43585E+12
F13	4.8884	22.131998	95.339047	410.02196	1764.1123	7590.4275	32658.927	140519.82	604607.19	2601411.3	11192955	48159334.7	207212620.6	891562775.7	3836079969	16505298256	71016473257	3.05559E+11	1.31471E+12	5.65674E+12
F14	2.3331	8.8377828	38.232371	164.91882	709.5884	3053.0183	13136.076	56519.912	243185.22	1046340.2	4502032.6	19370657.31	83345102.01	358604559.4	1542948858	6638764392	28564260189	1.22902E+11	5.28804E+11	2.27526E+12
F15	5.9995	24.823084	106.62801	458.90861	1974.4962	8495.5308	36553.301	157275.96	676702.92	2911613.8	12527647	53902042.63	231921466	997876217.4	4293509187	18473454746	79484756020	3.41995E+11	1.47148E+12	6.33127E+12
F16	5.8884	25.181071	108.47816	466.69547	2007.9704	8639.6007	37173.175	159943.04	688178.45	2960989	12740091	54816113.95	235854392.3	1014798211	4366318555	18786727756	80832659222	3.47794E+11	1.49644E+12	6.43864E+12
F17	6.8885	30.378617	129.97687	559.21603	2406.1863	10352.939	44545.042	191661.61	824652.27	3548187.7	15266599	65686788.67	282627069.1	1216044532	5232210449	22512354981	96862718304	4.16766E+11	1.7932E+12	7.7155E+12
F18	0.9999	4.0363074	17.373962	74.810522	321.90119	1385.0002	5959.1689	25640.207	110320.76	474671.3	2042343.1	8787481.471	37809431.45	162680639.6	699957378.1	3011669565	12958151245	55754351547	2.39891E+11	1.03217E+12
F19	4.5552	18.638791	79.803974	343.45266	1477.88	6358.7825	27359.569	117718.58	506501.51	2179297.2	9376746.8	40344832.28	173589574.6	746894675.2	3213624190	13827090718	59493091430	2.55978E+11	1.10138E+12	4.73886E+12
F20	3.9996	16.577287	71.121117	305.91196	1316.3727	5663.9004	24369.718	104854.3	451151.07	1941143.8	8352056.9	35935953.07	154619723.4	665274100.4	2862439662	12316067637	52991692392	2.28005E+11	9.81023E+11	4.221E+12

APPENDIX B

Factors	PS	order1	order2	order3	order4	order5	order6	order7	order8	order9	order10	order11	order12	order13	order14	order15	order16	order17	order18	order19
F1	0.4444	2.0367185	9.0170432	38.892922	167.28331	719.74227	3096.8271	13324.54	57330.791	246674.1635	1061351.866	4566622.502	19648564.95	84540840.5	363749400.1	1565085292	6734009654	28974066938	1.24665E+11	5.3639E+11
F2	5.8884	24.613227	106.40706	457.83966	1969.8912	8475.6843	36467.902	156908.53	675122.02	2904811.806	12498380.03	53776118.25	231379657.9	995545008.1	4283478817	18430297601	79299066058	3.41196E+11	1.46805E+12	6.31648E+12
F3	5.5551	23.156595	99.629285	428.61149	1844.2934	7935.3071	34142.798	146904.44	632077.93	2719608.278	11701514.6	50347487.56	216627470.1	932071550.4	4010374930	17255227960	74243156107	3.19442E+11	1.37445E+12	5.91376E+12
F4	2.4443	9.2329988	39.839048	171.78518	739.00767	3179.6643	13680.997	58864.506	253273.19	1089745.133	4688788.712	20174203.03	86802475.66	373480418	1606954428	6914157768	29749180693	1.28E+11	5.5074E+11	2.36964E+12
F5	4.6663	19.280772	82.352583	354.45083	1525.1992	6562.3455	28235.463	121487.23	522716.67	2249065.34	9676934.403	41636433.5	179146878.8	770805794	3316505295	14269751805	61397705860	2.64173E+11	1.13664E+12	4.89057E+12
F6	6.5553	28.181637	120.82478	520.00658	2237.4977	9627.0675	41421.889	178223.79	766834.05	3299416.293	14196223.86	61081341.09	262811453.5	1130784932	4865368479	20933963452	90071456607	3.87546E+11	1.66747E+12	7.17454E+12
F7	4.6664	19.2195	82.562974	355.654	1530.06	6583.3484	28325.823	121876.02	524389.49	2256262.914	9707903.032	41769680.58	179720194	773272566.8	3327118947	14315418606	61594193989	2.65018E+11	1.14028E+12	4.90622E+12
F8	5.4441	24.996611	107.67595	463.18734	1992.9296	8574.9147	36894.771	158745.2	683024.59	2938813.747	12644678.37	54405588.41	234088045.8	1007198245	4333618585	18646031326	80227292137	3.4519E+11	1.48523E+12	6.39042E+12
F9	4.1108	18.589574	80.667559	346.73315	1491.8104	6418.842	27617.992	118830.44	511285.47	2199880.924	9465311.214	40725893.61	175229147	753949176.7	3243977220	13957689094	60055010151	2.58396E+11	1.11178E+12	4.78362E+12
F10	5.7773	24.34161	104.36476	449.29189	1933.1362	8317.5452	35787.494	153980.95	662525.7	2850614.252	12265187.07	52772771.27	227062609.9	976970274.4	4203558293	18086427793	77819515635	3.3483E+11	1.44065E+12	6.19863E+12
F11	6.4439	30.612683	131.89907	567.22249	2440.5486	10500.827	45181.349	194399.4	836432.01	3598871.739	15484674.96	66625091.41	286664254.7	1233415117	5306949944	22833932651	98246353523	4.22719E+11	1.81881E+12	7.82571E+12
F12	6.8885	32.822817	141.87607	609.96948	2624.421	11292.049	48585.688	209047.04	899455.67	3870040.305	16651417.59	71645173.2	308263894.9	1326350746	5706819155	24554428744	1.05649E+11	4.54571E+11	1.95586E+12	8.41536E+12
F13	6.3331	28.342321	121.88875	523.99474	2254.5806	9700.8104	41739.088	179588.57	772706.26	3324682.304	14304934.59	61549084.98	264823990.4	1139444168	4902626115	21094269911	90761198726	3.90513E+11	1.68024E+12	7.22949E+12
F14	7.7777	35.860891	154.15221	662.97268	2852.5445	12273.486	52808.485	227216.28	977631.47	4206403.169	18098668.29	77872182.17	335056516.8	1441629942	6202824852	26688566204	1.14831E+11	4.94079E+11	2.12585E+12	9.14678E+12
F15	4.9997	20.935206	89.18502	383.90329	1651.9386	7107.6682	30581.77	131582.58	566153.39	2435958.198	10481068.42	45096338.38	194033628.4	834858223.7	3592100294	15455539822	66499733202	2.86125E+11	1.23109E+12	5.29696E+12
F16	4.1108	17.71314	74.926493	322.20414	1386.6881	5966.4071	25671.28	110454.48	475246.66	2044818.648	8798132.976	37855261.11	162877828.5	700805812.3	3015320078	12973858114	55821932660	2.40182E+11	1.03342E+12	4.44644E+12
F17	4.1108	16.083691	69.591491	299.65091	1289.2539	5547.1543	23867.472	102693.32	441853.08	1901137.891	8179925.386	35195332.03	151433092.4	651563152	2803446290	12062239979	51899561559	2.23305E+11	9.60805E+11	4.134E+12
F18	5.4439	26.452443	115.04563	494.95134	2129.3014	9161.6471	39419.389	169607.7	729762.07	3139908.658	13509918.8	58128412.61	250106044.5	1076118041	4630156139	19921927768	85717024231	3.6881E+11	1.58686E+12	6.8277E+12
F19	4.5552	19.626404	84.604528	363.69347	1564.7655	6732.7295	28968.597	124641.6	536288.83	2307461.558	9928192.719	42717509.36	183798366.7	790819504.7	3402617229	14640261065	62991876444	2.71032E+11	1.16615E+12	5.01755E+12
F20	5.5551	25.452732	110.06793	473.11259	2035.5763	8758.4261	37684.426	162142.77	697643.12	3001712.133	12915307.93	55570011.87	239098149	1028754951	4426369482	19045105705	81944368348	3.52578E+11	1.51702E+12	6.52719E+12

APPENDIX C

“ “CSFs	**References**
“Vendor”	“Esteves and Pastor (2001), Trimmer et al (2002), Upadhyay et al., (2011), Sun et al., 2015, Saxena et al., 2017”
“Selection of appropriate vendor”	“Aloini, Dulmin and Mininno (2007), Karande, Jain, and Ghatule (2012), Sun et al., 2015, Denolf et a., (2015), Saxena et al., 2017”
“ERP vendor characteristics /reputation”	Shaul and Tauber (2010), Al-Hinai, Edwards, and Humphries (2013), Sun et al., 2015, Saxena et al., 2017
“Partnership with vendor”	“Somers and Nelson (2001), Akkermans and van Helden (2002), Reimers (2003), Wong and Tein (2003),Somers and Nelson (2004), Li and Lin (2006), Plant and Willcocks (2007), Aloini, Dulmin and Mininno (2007), Ganesh and Mehta 2010, Shaul and Tauber (2010), (Al-Fawaz, Eldabi and Naseer 2010), Al-Fawaz, Eldabi and Kamal (2011), Al-Hinai, Edwards, and Humphries (2013), Kapur et al., (2014), Leyh (2014), Olugbara, Kalema and Kekwaletswe (2014), Sun et al., 2015, Leyh and Thomschke., 2015, Bintoro et al., 2015, Micheal Fripom (2015), Shatat (2015), Pecherskaya et al. (2015), Leyh (2016), Saade and Nijher (2016) Nagpal, Kumar and Khatri (2017), Saxena et al., 2017, Hentschel, Leyh and Baumhauer 2019)”
“Vendor support”	“Somers and Nelson (2001), Soliman et al. (2001), Akkermans and van Helden (2002), Zhang et al. (2003, Somers and Nelson (2004), Bajwa et al. (2004), Zhang et al (2005), Jafari et al. (2006), King and Burgess (2006), Remus (2007), Plant and Willcocks (2007), Woo (2007), Dezdar and Sulaiman (2009), Mehrjerdi 2010, Supramaniam and Kuppusamy (2010), Shaul and Tauber (2010), ALdayel, Aldayel, and Al-Mudimigh (2011), Chockalingam and Ramayah (2012), Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012), Ahmad et al., (2012), Ram, Corkindale and Wu (2013), Ahmad and Cuenca (2013), Kapur et al., (2014), Beheshti et al., 2014, Leyh (2014), Sun et al., 2015, Leyh and Thomschke., 2015, Pecherskaya et al. (2015), Ashja (2015), Leyh (2016), Nagpal, Kumar and Khatri (2017), Saxena et al., 2017, Ahmed, Shaikh, and Sarim (2017), Thompson, Olugbara and Singh (2018), Loonam et al. (2018), Reitsma and Hilletofth (2018), Hentschel, Leyh and Baumhauer 2019)”
“Use of vendors’ tools”	“Somers and Nelson (2001), Akkermans and van Helden (2002), Reimers (2003), Somers and Nelson (2004), Motwani et al (2005), Nah and Delgado (2006), Plant and Willcocks (2007), Shaul and Tauber (2010), Hairul, Nasir, and Sahibuddin (2011), Kapur et al., (2014), Leyh (2014), (Olugbara, Kalema and Kekwaletswe 2014), Sun et al., 2015, Leyh and Thomschke., 2015, Pecherskaya et al. (2015), Leyh (2016), Nagpal, Kumar and Khatri (2017), Saxena et al., (2017).”
“Keeping suppliers and customers informed”	“Mabert and Venkataramanan (2003), Nah and Delgado (2006), Shaul and Tauber (2010), Campos Fernandes Leandro et al. (2017), Sowan et al. (2017)”
“Project Management”	“Somers and Nelson (2001), Fui-Hoon Nah et al. (2001), Akkermans and van Helden (2002), Zhang et al. (2003), Nah et al (2003), Reimers (2003), Umble et al (2003), Al-Mashari, Al-Mudimigh and Zairi (2003), Somers and Nelson (2004), Bajwa et al. (2004), Zhang et al (2005), Yingjie (2005), Ehie and Madsen (2005), Bhatti (2005), Gargeya and Brady (2005), Jafari et al. (2006), Remus (2006), King and Burgess (2006), Soja (2006), Nah and Delgado (2006), Remus (2007), Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007), Finney and Corbett (2007), Woo (2007), Sawal et al (2008), Helo et al (2008), Muscatello and chen (2008), Dawson and Owens (2008), Ngai, Law, and Wat (2008), Snider et al. (2009), Françoise (2009), Rabaa'i (2009), Liu and Seddon (2009), Bologa et al., (2009), Dezdar and Sulaiman (2009), Mehrjerdi (2010), Hanafizadeh et al., (2010), Dey et al.,(2010), Ganesh and Mehta (2010), Supramaniam and Kuppusamy (2010), Shaul and Tauber (2010), Garg (2010), Al-Fawaz, Eldabi and Naseer (2010), Dezdar and Ainin (2011), Dantes and Hasibuan (2011) , ALdayel, Aldayel, and Al-Mudimigh (2011), Al-

	Fawaz, Eldabi and Kamal (2011), Hairul, Nasir, and Sahibuddin (2011) , Chockalingam and Ramayah (2012), Schniederjans and Yadav (2012), Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012), Ahmed et al. (2012), AlSudairi (2013), Ram, Corkindale and Wu (2013), Lawrence et al., (2013), Ahmad and Cuenca (2013), Ram et al.,(2014), Hart, and Snaddon, (2014), Kapur et al., (2014), Beheshti et al., (2014) ,Leyh (2014), Olugbara, Kalema and Kekwaletswe (2014), Gandhi (2015), Sun et al., (2015), Leyh and Thomschke. (2015), Denolf et a., (2015), Al-Sabaawi (2015), Shatat (2015), Pecherskaya et al. (2015), Ashja (2015), Leyh (2016), Nagpal, Kumar and Khatri (2017), Saxena et al., (2017), Campos Fernandes Leandro et al. (2017), Ahmed, Shaikh, and Sarim (2017), Al-Hadi and Al-Shaibany (2017), Loonam et al. (2018), Reitsma and Hilletofth (2018), Hentschel, Leyh and Baumhauer 2019)"
"Project leader"	"Brown and Vessey (2003),Bradley (2008) Karande, Jain, and Ghatule (2012),Ahmad and Cuenca (2013), Leyh (2014), Leyh and Thomschke (2015), Leyh (2016), Thompson, Olugbara and Singh (2018), Hentschel, Leyh and Baumhauer (2019)"
"Appointment & availability of competent project manager"	"Bajwa et al. (2004), Bradley (2008), Schniederjans and Yadav (2012), Al-Hinai, Edwards, and Humphries (2013) , Alias et al 2014,"
"project manager /Full time"	"Reimers (2003); ,Soja (2006),Bradley (2008),Sumner and Bradley (2009,Hairul, Nasir, and Sahibuddin (2011) ,Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Al-Hinai, Edwards, and Humphries (2013) ,Ahmad and Cuenca (2013),"
"Scope creep Management (Detail schedule)"	"Allen and Havenhand (2002),Nah et al (2003); ,Reimers (2003); ,Motwani et al (2005),Soja (2006),Nah and Delgado (2006),Bradley (2008),Sammon et al. (2009,Shaul and Tauber (2010),Koh et al. (2011),ALdayel, Aldayel, and Al-Mudimigh (2011), Hairul, Nasir, and Sahibuddin (2011), Ziemba and Oblak, 2013,Ahmad and Cuenca (2013),Alias et al 2014,Micheal Fripom (2015),Pecherskaya et al. (2015),Ahmed, Shaikh, and Sarim (2017),Loonam et al. (2018),"
"Assign responsibility/ Clear roles & responsibilities"	"Nah et al (2003); ,Kraemmerand et al (2003),Nah and Delgado (2006), Hairul, Nasir, and Sahibuddin (2011) ,Ziemba and Oblak, 2013,Al-Hinai, Edwards, and Humphries (2013) ,(Olugbara, Kalema and Kekwaletswe 2014),"
"control project scope"	"Nah et al (2003), Nah and Delgado (2006), Al-Hinai, Edwards, and Humphries (2013), Micheal Fripom (2015), Saxena et al., 2017, Ahmed, Shaikh, and Sarim (2017),"
"Evaluate any propose change"	"Nah et al (2003), Nah and Delgado (2006), Bologa et al., (2009),"
"Control and assess scope expansion requests/ assessment"	"Chrusciel and Field (2006), Nah and Delgado (2006), Micheal Fripom (2015),"
"Define project miles stones"	"Nah and Delgado (2006),"
"Set realistic milestone and end dates"	"Murray and Coffin (2001), Nah et al (2003), Nah and Delgado (2006),"
"Knowledge transfer management"	"Esteves and Pastor (2001),Allen and Havenhand (2002),Françoise (2009),Shaul and Tauber (2010),Jeng and Dunk., 2013,Leyh (2014),Leyh and Thomschke., 2015,Leyh (2016),Saade and Nijher (2016),Saxena et al., 2017,"
"Management of conflicts"	"Shaul and Tauber (2010), Al-Hinai, Edwards, and Humphries (2013),"
"Management of legacy systems"	"Allen and Havenhand (2002),Al-Mashari, Al-Mudimigh and Zairi (2003),Finney and Corbett (2007),Aloini, Dulmin and Mininno (2007),Helo et al 2008,Žabjek et al (2009),Ganesh and Mehta 2010,Shaul and Tauber (2010),Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Ahmad et al., (2012),Lawrence et al., (2013),Ahmad and Cuenca (2013),Leyh (2014),Leyh and Thomschke., 2015,Leyh (2016),Saade and Nijher (2016),Saxena et al., 2017,Ahmed, Shaikh, and Sarim (2017),Loonam et al. (2018),"

“Clear and defined project plan”	“Shaul and Tauber (2010), Micheal Fripom (2015), Saxena et al., 2017, Thompson, Olugbara and Singh (2018),”
“Planning required upgrades”	“Shaul and Tauber (2010), Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),”
“Management of expectations”	“Somers and Nelson (2001),Akkermans and van Helden (2002),Reimers (2003); ,Mabert and Venkataramanan (2003); ,Wong and Tein (2003),Somers and Nelson (2004),King and Burgess (2006),Remus (2007),Plant and Willcocks (2007),Mehrjerdi 2010,Shaul and Tauber (2010),Koh et al. (2011),Ahmad et al., (2012),Ram, Corkindale and Wu (2013),Al-Hinai, Edwards, and Humphries (2013) ,Ahmad and Cuenca (2013),Kapur et al., (2014),(Olugbara, Kalema and Kekwaletswe 2014),Pecherskaya et al. (2015),Venkatraman and Fahd (2016),Nagpal, Kumar and Khatri (2017),Saxena et al., 2017,Ahmed, Shaikh, and Sarim (2017),Loonam et al. (2018),”
“Management of risks”	“Esteves and Pastor (2001),Motwani et al (2005),Bhatti (2005),Iskanius(2009),Hanafizadeh et al., 2010,Dey et al.,(2010),Ganesh and Mehta 2010,Shaul and Tauber (2010),Dantes and Hasibuan (2011) , Hairul, Nasir, and Sahibuddin (2011) ,Ziemba and Oblak, 2013,Al-Hinai, Edwards, and Humphries (2013), Ahmad and Cuenca (2013),Pecherskaya et al. (2015),Saade and Nijher (2016),”
“Effective project management methodology”	"Doom (2010), Hairul, Nasir, and Sahibuddin (2011), Ziemba and Oblak, 2013, Al-Hinai, Edwards, and Humphries (2013), García, Rivera and Iniesta (2013), Ahmad and Cuenca (2013),Thompson, Olugbara and Singh (2018),”
“Project tracking”	“Shaul and Tauber (2010), Chockalingam and Ramayah (2012),”
“Total quality management approach”	"Bajwa et al. (2004), Hanafizadeh et al., 2010, Ganesh and Mehta 2010,Shaul and Tauber (2010),Al-Fawaz, Eldabi and Kamal (2011), Hairul, Nasir, and Sahibuddin (2011), Alias et al 2014,Saade and Nijher (2016),Loonam et al. (2018),"
“Interdepartmental communication and cooperation”	“Somers and Nelson (2001),Soliman et al.(2001),Fui-Hoon Nah et al. (2001),Xu et al (2002); ,Akkermans and van Helden (2002),Allen and Havenhand (2002),Sarker and Lee (2003); ,Nah et al (2003); ,Reimers (2003); ,Mabert and Venkataramanan (2003); ,Kraemmerand et al (2003),Al-Mashari, Al-Mudimigh and Zairi (2003),Wong and Tein (2003),Somers and Nelson (2004),Amoako-Gyampah (2004),Ward et al (2005),Motwani et al (2005),Bhatti (2005),Gargeya and Brady (2005),Jafari et al. (2006,Remus (2006); ,King and Burgess (2006),Chrusciel and Field (2006),Remus (2007),Yokota (2007,Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,Finney and Corbett (2007),Plant and Willcocks (2007),Woo (2007),Aloini, Dulmin and Mininno (2007),Helo et al 2008, Muscatello and chen (2008), Dawson and Owens (2008),Bradley (2008),Ngai, Law, and Wat (2008),Sammon et al. (2009,Françoise (2009),Žabjek et al (2009),Rabaa'i (2009),Dezdar and Sulaiman (2009),Mehrjerdi 2010,Hanafizadeh et al., 2010,Ganesh and Mehta 2010,Doom (2010),Supramaniam and Kuppusamy (2010),Shaul and Tauber (2010),(Al-Fawaz, Eldabi and Naseer 2010),Dantes and Hasibuan (2011) ,ALdayel, Aldayel, and Al-Mudimigh (2011),Al-Fawaz, Eldabi and Kamal (2011), Hairul, Nasir, and Sahibuddin (2011) ,Chockalingam and Ramayah (2012),Schniederjans and Yadav (2012),Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Ahmad et al., (2012),Ziemba and Oblak, 2013,AlSudairi (2013),Ram, Corkindale and Wu (2013),García, Rivera and Iniesta (2013),Lawrence et al., (2013),Ahmad and Cuenca (2013),Jeng and Dunk., 2013,Hart, and Snaddon, 2014,Kapur et al., (2014),Alias et al 2014,Beheshti et al., 2014,Leyh (2014),(Olugbara, Kalema and Kekwaletswe 2014),Sun et al., 2015,Leyh and Thomschke., 2015,Denolf et a., (2015),Bintoro et al., 2015,Micheal Fripom (2015),Al-Sabaawi 2015,Pecherskaya et al. (2015),Ashja (2015),Leyh (2016),Venkatraman and Fahd (2016),Saade and Nijher (2016),Nagpal, Kumar and Khatri (2017),Saxena et al., 2017,Campos Fernandes Leandro et al. (2017),Al-Hadi and

	Al-Shaibany (2017),Thompson, Olugbara and Singh (2018),Loonam et al. (2018),Reitsma and Hilletofth (2018),Hentschel, Leyh and Baumhauer 2019),”
“Open and honest communication (Targeted and effective communication, among stakeholders, expectations communicated at all level and progress communication)”	“Fui-Hoon Nah et al. (2001),Nah et al (2003); ,Motwani et al (2005),Nah and Delgado (2006),Bradley (2008),Ngai, Law, and Wat (2008),Rabaa'i (2009),Dezdar and Sulaiman (2009),Shaul and Tauber (2010),Karande, Jain, and Ghatule (2012),Ram, Corkindale and Wu (2013),Al-Hinai, Edwards, and Humphries (2013) ,Saade and Nijher (2016),Saxena et al., 2017,Ahmed, Shaikh, and Sarim (2017),”
“Professional training services”	“Shaul and Tauber (2010),”
“Setting realistic deadlines”	“Shaul and Tauber (2010),”
“Project Management to implement project plan”	“Wong and Tein (2003), Doom (2010), Thompson, Olugbara and Singh (2018),”
“Change management”	"Somers and Nelson (2001), Esteves and Pastor (2001),Fui-Hoon Nah et al. (2001),Xu et al (2002); ,Akkermans and van Helden (2002),Nah et al (2003); ,Mabert and Venkataramanan (2003); ,Umble et al (2003),Al-Mashari, Al-Mudimigh and Zairi (2003),Wong and Tein (2003),Somers and Nelson (2004),Amoako-Gyampah (2004),Bajwa et al. (2004,Motwani et al (2005),Bhatti (2005),Gargeya and Brady (2005),Remus (2006); ,Soja (2006),Nah and Delgado (2006),Remus (2007),Yokota (2007,Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,Finney and Corbett (2007),Plant and Willcocks (2007),Aloini, Dulmin and Mininno (2007),Helo et al 2008, Dawson and Owens (2008),Bradley (2008),Ngai, Law, and Wat (2008),Seidel and Back (2009,Françoise (2009),Žabjek et al (2009),Rabaa'i (2009),Liu and Seddon (2009) ,Dezdar and Sulaiman (2009),Ganesh and Mehta 2010,Shaul and Tauber (2010),(Al-Fawaz, Eldabi and Naseer 2010),Dantes and Hasibuan (2011) ,ALdayel, Aldayel, and Al-Mudimigh (2011),Al-Fawaz, Eldabi and Kamal (2011), Hairul, Nasir, and Sahibuddin (2011) ,Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Ahmad et al., (2012),Ziemba and Oblak, 2013,AlSudairi (2013),Al-Hinai, Edwards, and Humphries (2013) ,Lawrence et al., (2013),Ahmad and Cuenca (2013),Hart, and Snaddon, 2014,Kapur et al., (2014),Leyh (2014),(Olugbara, Kalema and Kekwaletswe 2014),Sun et al., 2015,Leyh and Thomschke., 2015,Denolf et a., (2015),Bintoro et al., 2015,Al-Sabaawi 2015,Shatat (2015),Pecherskaya et al. (2015),Ashja (2015),Leyh (2016),Venkatraman and Fahd (2016),Saade and Nijher (2016),Nagpal, Kumar and Khatri (2017),Saxena et al., 2017,Campos Fernandes Leandro et al. (2017),Ahmed, Shaikh, and Sarim (2017),Al-Hadi and Al-Shaibany (2017),Thompson, Olugbara and Singh (2018),Reitsma and Hilletofth (2018),Hentschel, Leyh and Baumhauer 2019),"
“Change management program”	“Fui-Hoon Nah et al. (2001),Nah et al (2003); ,Wong and Tein (2003),Somers and Nelson (2004),Amoako-Gyampah (2004),Ngai, Law, and Wat (2008),Françoise (2009),Liu and Seddon (2009) ,Dezdar and Sulaiman (2009),Ganesh and Mehta 2010,Shaul and Tauber (2010),Ahmad et al., (2012),Al-Hinai, Edwards, and Humphries (2013) ,Beheshti et al., 2014,Sykes 2015,Saade and Nijher (2016),Ahmed, Shaikh, and Sarim (2017),Reitsma and Hilletofth (2018),”
“Understanding the political structure (Political influence)”	“Allen and Havenhand (2002), Shaul and Tauber (2010), Ahmad and Cuenca (2013), (Olugbara, Kalema and Kekwaletswe 2014),”
“User participation in defying new processes”	“Shaul and Tauber (2010),”
“Understanding the organizational culture / (norms, values & beliefs)”	“Fui-Hoon Nah et al. (2001),Allen and Havenhand (2002),Zhang et al. (2003,Bajwa et al. (2004,Zhang et al (2005),Motwani et al (2005),Remus (2006); ,Soja (2006),Nah and Delgado (2006),Sawal et al (2008),Bradley (2008),Ngai, Law, and Wat (2008),Seidel and Back (2009,Françoise (2009),Dezdar and Sulaiman (2009),Hanafizadeh et al., 2010,Ganesh and Mehta 2010,Doom (2010),Shaul and Tauber (2010),(Al-Fawaz, Eldabi and Naseer 2010),(Abdelghaffar and Azim 2010),Upadhyay et al 2011,Al-Fawaz, Eldabi and Kamal (2011),Ram, Corkindale and Wu (2013),Al-Hinai, Edwards, and Humphries (2013) ,Ahmad and Cuenca (2013),Beheshti et al., 2014,Leyh (2014),(Olugbara, Kalema and Kekwaletswe 2014),Leyh and Thomschke., 2015,Micheal Fripom (2015),Ashja (2015),Leyh (2016),Alsoub et al. (2017),Campos Fernandes Leandro et al. (2017),Ahmed, Shaikh, and

	Sarim (2017),(Aremu, Shahzad and Hassan 2018),Thompson, Olugbara and Singh (2018),Loonam et al. (2018),Hentschel, Leyh and Baumhauer 2019),”
“Developing a culture of continuous improvement”	“Zhang et al (2005), Motwani et al (2005), (Abdelghaffar and Azim 2010), García, Rivera and Iniesta (2013), Loonam et al. (2018),”
“National culture”	“Ngai, Law, and Wat (2008), (Olugbara, Kalema and Kekwaletswe 2014), Saxena et al., 2017,”
“Recognizing the need for change”	“Nah and Delgado (2006), Seidel and Back (2009, Al-Hinai, Edwards, and Humphries (2013), Ahmed, Shaikh, and Sarim (2017),”
“Commitment to change -perseverance and determination”	“Nah et al (2003), Nah and Delgado (2006), Dawson and Owens (2008), Bintoro et al., 2015,”
“Project team competence (formulation, composition and involvement)”	“Somers and Nelson (2001),Fui-Hoon Nah et al. (2001),Xu et al (2002); ,Akkermans and van Helden (2002),Sarker and Lee (2003); ,Nah et al (2003); ,Reimers (2003); ,Mabert and Venkataramanan (2003); ,Kraemmerand et al (2003),Umble et al (2003),Wong and Tein (2003),Somers and Nelson (2004),Motwani et al (2005),Bhatti (2005),Gargeya and Brady (2005),Remus (2006); ,King and Burgess (2006),Soja (2006),Nah and Delgado (2006),Remus (2007),Yokota (2007,Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,Finney and Corbett (2007),Plant and Willcocks (2007),Woo (2007),Aloini, Dulmin and Mininno (2007), Dawson and Owens (2008),Bradley (2008),Žabjek et al (2009),Rabaa'i (2009),Liu and Seddon (2009) ,Bologa et al., (2009),Dezdar and Sulaiman (2009),Mehrjerdi 2010,Hanafizadeh et al., 2010,Ganesh and Mehta 2010,Doom (2010),Supramaniam and Kuppusamy (2010),Shaul and Tauber (2010),Garg (2010),Upadhyay et al 2011,Dezdar and Ainin 2011,Dantes and Hasibuan (2011) ,ALdayel, Aldayel, and Al-Mudimigh (2011),Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Ahmad et al., (2012),Karande, Jain, and Ghatule (2012),Ziemba and Oblak, 2013,Ram, Corkindale and Wu (2013),Al-Hinai, Edwards, and Humphries (2013) ,García, Rivera and Iniesta (2013),Lawrence et al., (2013),Ahmad and Cuenca (2013),Hart, and Snaddon, 2014,Kapur et al., (2014),Alias et al 2014,Leyh (2014),(Olugbara, Kalema and Kekwaletswe 2014),Gandhi (2015),Leyh and Thomschke., 2015,Denolf et a., (2015),Micheal Fripom (2015),Pecherskaya et al. (2015),Leyh (2016),Saade and Nijher (2016),Nagpal, Kumar and Khatri (2017),Saxena et al., 2017,Campos Fernandes Leandro et al. (2017),Thompson, Olugbara and Singh (2018),Loonam et al. (2018),Reitsma and Hilletofth (2018),Hentschel, Leyh and Baumhauer 2019),”
“Team finest cross functional knowledge /small internal team”	“Nah et al (2003), Motwani et al (2005), Nah and Delgado (2006), Finney and Corbett (2007), Snider et al. (2009, Hanafizadeh et al., 2010, Shaul and Tauber (2010), Chockalingam and Ramayah (2012), Ahmad et al., (2012), Al-Hinai, Edwards, and Humphries (2013), Lawrence et al., (2013), Saade and Nijher (2016),”
“Trust between various shareholders”	“Li and Lin 2006, Schniederjans and Yadav (2012),Karande, Jain, and Ghatule (2012),Ahmad and Cuenca (2013),(Olugbara, Kalema and Kekwaletswe 2014),Ashja (2015),”
“Good relations between project team and users (Partnership, trust, risk-sharing and incentives)”	“Nah et al (2003); ,Reimers (2003); ,Bajwa et al. (2004,Ward et al (2005),Li and Lin 2006,Nah and Delgado (2006),Hanafizadeh et al., 2010,Shaul and Tauber (2010),Schniederjans and Yadav (2012),Al-Hinai, Edwards, and Humphries (2013) ,Ahmad and Cuenca (2013),(Olugbara, Kalema and Kekwaletswe 2014),Denolf et a., (2015),Bintoro et al., 2015,Ahmed, Shaikh, and Sarim (2017),”
“Team morale and motivation”	"Trimmer et al (2002), Brown and Vessey (2003, Soja (2006),Finney and Corbett (2007),Bradley (2008),Liu and Seddon (2009) ,Ganesh and Mehta 2010,Shaul and Tauber (2010), Hairul, Nasir, and Sahibuddin (2011) ,Ahmad et al., (2012),Al-Hinai, Edwards, and Humphries (2013) ,García, Rivera and Iniesta (2013),Lawrence et al., (2013),Alias et al 2014,(Olugbara, Kalema and Kekwaletswe 2014),Saade and Nijher (2016),Ahmed, Shaikh, and Sarim (2017),Loonam et al. (2018),"
“Full time team members”	“Fui-Hoon Nah et al. (2001), Nah et al (2003); ,Soja (2006),Nah and Delgado (2006),Dezdar and Sulaiman (2009),Shaul and Tauber (2010),Ram, Corkindale and Wu (2013),Saade and Nijher (2016),”
“Balanced and cross functional project team”	“Fui-Hoon Nah et al. (2001),Sarker and Lee (2003); ,Nah et al (2003); ,Finney and Corbett (2007),Liu and Seddon (2009) ,Shaul and Tauber (2010),Ahmad et al., (2012),Ram, Corkindale and Wu (2013),Lawrence et al., (2013),Leyh

	(2014),Sun et al., 2015,Leyh and Thomschke., 2015,Bintoro et al., 2015,Leyh (2016),Saade and Nijher (2016),Loonam et al. (2018),”
“Allocating valuable resources/Dedicating resources”	"Somers and Nelson (2001),Akkermans and van Helden (2002),Nah et al (2003); ,Reimers (2003); ,Somers and Nelson (2004),Bajwa et al. (2004,Remus (2006); ,Nah and Delgado (2006),Remus (2007),Plant and Willcocks (2007),Supramaniam and Kuppusamy (2010),Shaul and Tauber (2010),ALdayel, Aldayel, and Al-Mudimigh (2011), Hairul, Nasir, and Sahibuddin (2011) ,Schniederjans and Yadav (2012),Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),García, Rivera and Iniesta (2013),Ahmad and Cuenca (2013),Kapur et al., (2014),Leyh (2014),Sun et al., 2015,Leyh and Thomschke., 2015,Pecherskaya et al. (2015),Leyh (2016),Nagpal, Kumar and Khatri (2017),Saxena et al., 2017,(Aremu, Shahzad and Hassan 2018),Loonam et al. (2018),Hentschel, Leyh and Baumhauer 2019),"
“Culture of resistance/ enabling constraints”	“Bajwa et al. (2004), Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012), Leyh (2014), Olugbara, Kalema and Kekwaletswe (2014), Leyh and Thomschke., 2015, Leyh (2016),Loonam et al. (2018),Hentschel, Leyh and Baumhauer 2019),”
“Counselling to staff to minimize resistance to change”	“Motwani et al (2005), Remus (2007), Seidel and Back (2009), Karande, Jain, and Ghatule (2012), Olugbara, Kalema and Kekwaletswe (2014), Venkatraman and Fahd (2016),Hentschel, Leyh and Baumhauer 2019),”
“Staff retention”	“Trimmer et al (2002), Allen and Havenhand (2002), Reimers (2003), Ganesh and Mehta 2010, Shaul and Tauber (2010),Micheal Fripom (2015),Hentschel, Leyh and Baumhauer 2019),”
“Empowered decision makers”	“Sarker and Lee (2003); ,Nah et al (2003); ,Reimers (2003); ,Soja (2006),Nah and Delgado (2006),Finney and Corbett (2007),Hanafizadeh et al., 2010,Ganesh and Mehta 2010,Shaul and Tauber (2010),Ahmad et al., (2012),Al-Hinai, Edwards, and Humphries (2013) ,Lawrence et al., (2013),Ahmad and Cuenca (2013),Leyh (2014),Micheal Fripom (2015),Leyh (2016),Saxena et al., 2017,Thompson, Olugbara and Singh (2018),”
“Work time schedule”	“Soja (2006), Ram, Corkindale and Wu (2013), Ahmad and Cuenca (2013), Ahmed, Shaikh, and Sarim (2017),”
“Performance tied to compensation”	“Nah et al (2003), Reimers (2003), Soja (2006), Nah and Delgado (2006), Bradley (2008), Sykes 2015, Ahmed, Shaikh, and Sarim (2017),”
“Availability of qualified implementation team”	“Dawson and Owens (2008), (Al-Fawaz, Eldabi and Naseer 2010), Al-Fawaz, Eldabi and Kamal (2011), Al-Hinai, Edwards, and Humphries (2013) ,”
“Deep understanding strategy”	“Shaul and Tauber (2010),”
“Organizational characteristics”	“Ngai, Law, and Wat (2008), Shaul and Tauber (2010), Ahmad et al., (2012), Saini et al.2013, Al-Hinai, Edwards, and Humphries (2013) ,Jeng and Dunk., 2013,(Olugbara, Kalema and Kekwaletswe 2014),”
“Former major change experience”	“Shaul and Tauber (2010),”
“Having in place advanced technology”	“Iskanius (2009), Shaul and Tauber (2010), Ahmad and Cuenca (2013), (Olugbara, Kalema and Kekwaletswe 2014), Sowan et al. (2017) ,”
“Former major IT change experience/Previous organization’s experience with complex IS”	“Shaul and Tauber (2010), Schniederjans and Yadav (2012), Ziemba and Oblak, 2013, Al-Hinai, Edwards, and Humphries (2013) ,”
“Interdepartmental coordination/ company wide”	“Zhang et al. (2003), Somers and Nelson (2004), Zhang et al (2005), Motwani et al (2005), Hanafizadeh et al., 2010, Shaul and Tauber (2010),Micheal Fripom (2015),Al-Sabaawi 2015,Saxena et al., 2017,”
“Organization transformation and software migration”	“Ram, Corkindale and Wu (2013),”
“Clear organizational strategy”	“Hanafizadeh et al., 2010, Doom (2010), Al-Hinai, Edwards, and Humphries (2013) ,Leyh (2014),Leyh and Thomschke., 2015,Leyh (2016),Ahmed, Shaikh, and Sarim (2017),”

“Organization encouragement of continuous learning”	“Al-Hinai, Edwards, and Humphries (2013), Shatat (2015),”
“Organization structure”	“Kraemmerand et al (2003),Wong and Tein (2003),Sun et al. (2005,Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,(Al-Fawaz, Eldabi and Naseer 2010),(Abdelghaffar and Azim 2010),Al-Fawaz, Eldabi and Kamal (2011),Al-Hinai, Edwards, and Humphries (2013) ,García, Rivera and Iniesta (2013),Leyh (2014),Leyh and Thomschke., 2015,Leyh (2016),Venkatraman and Fahd (2016),Saxena et al., 2017,Ahmed, Shaikh, and Sarim (2017),(Aremu, Shahzad and Hassan 2018),Loonam et al. (2018),”
“Implementation strategy”	“Allen and Havenhand (2002),Remus (2006); ,Soja (2006),Nah and Delgado (2006),Finney and Corbett (2007),Ngai, Law, and Wat (2008),Ganesh and Mehta 2010,Shaul and Tauber (2010),Dantes and Hasibuan (2011) ,Ahmad et al., (2012),Al-Hinai, Edwards, and Humphries (2013) ,Lawrence et al., (2013),Gandhi (2015),Micheal Fripom (2015),Saxena et al., 2017,Thompson, Olugbara and Singh (2018),Loonam et al. (2018),”
“Project definition and organization”	“Soja (2006),”
“Implementation promotion”	“Soja (2006), (Olugbara, Kalema and Kekwaletswe 2014),”
“Consultant's domain knowledge & experience”	“Bradley (2008), Snider et al. (2009), Al-Hinai, Edwards, and Humphries (2013) , García, Rivera and Iniesta (2013),Pecherskaya et al. (2015),Saxena et al., 2017,Thompson, Olugbara and Singh (2018),”
“Appointment of consultant/ external consultant involve in implementation (third party)”	“Brown and Vessey (2003,Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,Bradley (2008),(Al-Fawaz, Eldabi and Naseer 2010),Al-Fawaz, Eldabi and Kamal (2011),Al-Hinai, Edwards, and Humphries (2013) ,Leyh (2014),Leyh and Thomschke., 2015,Leyh (2016),Saxena et al., 2017,Ahmed, Shaikh, and Sarim (2017),Hentschel, Leyh and Baumhauer 2019),”
“Managing consultants”	“Aloini, Dulmin and Mininno (2007), Ahmad and Cuenca (2013), Saxena et al., 2017,”
“Use of consultants (Consultant selection and relationship)”	“Somers and Nelson (2001),Trimmer et al (2002),Akkermans and van Helden (2002),Reimers (2003); ,Wong and Tein (2003),Somers and Nelson (2004),Motwani et al (2005),Ehie and Madsen (2005),Bhatti (2005),Finney and Corbett (2007),Plant and Willcocks (2007),Bradley (2008),Žabjek et al (2009),Rabaa'i (2009),Liu and Seddon (2009) ,Bologa et al., (2009),Dezdar and Sulaiman (2009),Hanafizadeh et al., 2010,Ganesh and Mehta 2010,Doom (2010),Supramaniam and Kuppusamy (2010),Shaul and Tauber (2010),Dantes and Hasibuan (2011) ,ALdayel, Aldayel, and Al-Mudimigh (2011),Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Ahmad et al., (2012),Ziemba and Oblak, 2013,Ram, Corkindale and Wu (2013),Al-Hinai, Edwards, and Humphries (2013) ,Lawrence et al., (2013),Ahmad and Cuenca (2013),Kapur et al., (2014),Beheshti et al., 2014,Gandhi (2015),Bintoro et al., 2015,Micheal Fripom (2015),Pecherskaya et al. (2015),Ashja (2015),Nagpal, Kumar and Khatri (2017),Saxena et al., 2017,Campos Fernandes Leandro et al. (2017),Ahmed, Shaikh, and Sarim (2017),Thompson, Olugbara and Singh (2018),Loonam et al. (2018),”
“Decision making process style/Strategic Decision making”	“Reimers (2003), Mabert and Venkataramanan (2003); ,Motwani et al (2005),Aloini, Dulmin and Mininno (2007),Shaul and Tauber (2010),(Olugbara, Kalema and Kekwaletswe 2014),Reitsma and Hilletofth (2018),”
“Focused performance measures plan”	“Umble et al (2003), Ganesh and Mehta 2010, Shaul and Tauber (2010),Al-Hinai, Edwards, and Humphries (2013) ,Reitsma and Hilletofth (2018),”
“Planning the cost of ERP implementation-Project cost planning and management”	“Finney and Corbett (2007),Sammon et al. (2009,Hanafizadeh et al., 2010,Ganesh and Mehta 2010,Shaul and Tauber (2010),Ahmad et al., (2012),Lawrence et al., (2013),Alias et al 2014,Sun et al., 2015,Bintoro et al., 2015,Alsoub et al. (2017),Saxena et al., 2017,”

“Regard as a technological, business ,and organizational project”	“Amoako-Gyampah (2004),Sun et al. (2005,Iskanius(2009),Shaul and Tauber (2010),(Abdelghaffar and Azim 2010),Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Saini et al.2013,Ahmad and Cuenca (2013),(Olugbara, Kalema and Kekwaletswe 2014),Sowan et al. (2017) ,”
“Alignment between business strategy and IT strategy”	“Kraemmerand et al (2003),Bradford and Florin (2003),Motwani et al (2005),Sumner and Bradley (2009,Hanafizadeh et al., 2010,Shaul and Tauber (2010),Chockalingam and Ramayah (2012),Al-Hinai, Edwards, and Humphries (2013) ,Hart, and Snaddon, 2014,(Olugbara, Kalema and Kekwaletswe 2014),Denolf et a., (2015),Shatat (2015),Venkatraman and Fahd (2016),Saxena et al., 2017,Ahmed, Shaikh, and Sarim (2017),Loonam et al. (2018),Reitsma and Hilletofth (2018),Hentschel, Leyh and Baumhauer 2019),”
“Ensuring fair time to fulfill the implementation”	“Trimmer et al (2002), Sammon et al. (2009, Ganesh and Mehta 2010, Shaul and Tauber (2010), (Al-Fawaz, Eldabi and Naseer 2010), Al-Fawaz, Eldabi and Kamal (2011), Gandhi (2015),”
“Business change is first to be considered”	“Shaul and Tauber (2010),”
“Architecture choices”	“Somers and Nelson (2001),Akkermans and van Helden (2002),Somers and Nelson (2004),Nah and Delgado (2006),Remus (2007),Plant and Willcocks (2007),Supramaniam and Kuppusamy (2010),Shaul and Tauber (2010),Kapur et al., (2014),(Olugbara, Kalema and Kekwaletswe 2014),Pecherskaya et al. (2015),Nagpal, Kumar and Khatri (2017),”
"Functional requirements are clearly defined before deciding on ERP adaptation/country related/carefully defined information and system requirement"	"Ngai, Law, and Wat (2008), Sammon et al. (2009), Doom (2010),Shaul and Tauber (2010), Hairul, Nasir, and Sahibuddin (2011), Ahmad et al., (2012), Ahmad and Cuenca (2013),(Olugbara, Kalema and Kekwaletswe 2014),Saxena et al., 2017,"
“Continues focus on organizational resistance”	“Shaul and Tauber (2010), García, Rivera and Iniesta (2013), (Olugbara, Kalema and Kekwaletswe 2014), Hentschel, Leyh and Baumhauer 2019),”
“Level of implementation acceleration”	“Shaul and Tauber (2010),”
“Implementation approach”	“Ram, Corkindale and Wu (2013),”
“Implementer's domain knowledge & experience”	“Sumner and Bradley (2009), Al-Hinai, Edwards, and Humphries (2013), García, Rivera and Iniesta (2013),”
“Project champion”	“Somers and Nelson (2001),Fui-Hoon Nah et al. (2001),Akkermans and van Helden (2002),Nah et al (2003); ,Reimers (2003); ,Wong and Tein (2003),Somers and Nelson (2004),Motwani et al (2005),Gargeya and Brady (2005),King and Burgess (2006),Nah and Delgado (2006),Remus (2007),Yokota (2007,Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,Finney and Corbett (2007),Plant and Willcocks (2007), Muscatello and chen (2008), Dawson and Owens (2008),Bradley (2008),Ngai, Law, and Wat (2008),Sumner and Bradley (2009,Françoise (2009),Liu and Seddon (2009) ,Bologa et al., (2009),Dezdar and Sulaiman (2009),Mehrjerdi 2010,Hanafizadeh et al., 2010,Ganesh and Mehta 2010,Supramaniam and Kuppusamy (2010),Shaul and Tauber (2010),Garg (2010),(Al-Fawaz, Eldabi and Naseer 2010),Al-Fawaz, Eldabi and Kamal (2011),Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Ahmad et al., (2012),Ram, Corkindale and Wu (2013),Lawrence et al., (2013),Ahmad and Cuenca (2013),Kapur et al., (2014),Leyh (2014),(Olugbara, Kalema and Kekwaletswe 2014),Leyh and Thomschke., 2015,Denolf et a., (2015),Micheal Fripom (2015),Shatat (2015),Ashja (2015),Leyh (2016),Nagpal, Kumar and Khatri (2017),Saxena et al., 2017,Campos Fernandes Leandro et al. (2017),Loonam et al. (2018),”
“Education and training”	“Murray and Coffin (2001),Xu et al (2002); ,Zhang et al. (2003,Nah et al (2003); ,Reimers (2003); ,Mabert and Venkataramanan (2003); ,Kraemmerand et al (2003),Bradford and Florin (2003),Umble et al (2003),Al-Mashari, Al-Mudimigh and Zairi (2003),Wong and Tein (2003),Somers and Nelson (2004),Amoako-Gyampah (2004),Bajwa et al. (2004,Zhang et al (2005),Yingjie (2005); ,Jafari et al. (2006,Remus (2006); ,Soja (2006),Nah and Delgado (2006),Finney and Corbett (2007),Aloini, Dulmin and Mininno (2007),Helo et al 2008, Muscatello and chen (2008),Bradley (2008),Rabaa'i (2009),Dezdar and Sulaiman (2009),Hanafizadeh et al., 2010,Ganesh and Mehta 2010,Supramaniam and Kuppusamy (2010),Shaul and Tauber (2010),Garg (2010),(Al-Fawaz, Eldabi and Naseer

	2010),Dantes and Hasibuan (2011) ,ALdayel, Aldayel, and Al-Mudimigh (2011),Al-Fawaz, Eldabi and Kamal (2011),Chockalingam and Ramayah (2012),Schniederjans and Yadav (2012),Karande, Jain, and Ghatule (2012),Ram, Corkindale and Wu (2013),Al-Hinai, Edwards, and Humphries (2013) ,García, Rivera and Iniesta (2013),Ahmad and Cuenca (2013),Ram et al.,(2014),Hart, and Snaddon, 2014,(Olugbara, Kalema and Kekwaletswe 2014),Sun et al., 2015,Sykes 2015,Micheal Fripom (2015),Shatat (2015),Pecherskaya et al. (2015),Ashja (2015),Venkatraman and Fahd (2016),Saxena et al., 2017,Campos Fernandes Leandro et al. (2017),Soliman and Karia (2017),Sowan et al. (2017) ,Al-Hadi and Al-Shaibany (2017),Thompson, Olugbara and Singh (2018),Loonam et al. (2018),Reitsma and Hilletofth (2018),”
“Education and training to technical staff /IT workforce re-skilling”	"Murray and Coffin (2001),Nah et al (2003); ,Umble et al (2003),Somers and Nelson (2004),Nah and Delgado (2006),Finney and Corbett (2007),Liu and Seddon (2009) ,Hanafizadeh et al., 2010,Doom (2010),Shaul and Tauber (2010), Hairul, Nasir, and Sahibuddin (2011) ,Ahmad et al., (2012),Karande, Jain, and Ghatule (2012),Ram, Corkindale and Wu (2013),Al-Hinai, Edwards, and Humphries (2013) ,García, Rivera and Iniesta (2013),Lawrence et al., (2013),Alias et al 2014,Saxena et al., 2017,Ahmed, Shaikh, and Sarim (2017),Reitsma and Hilletofth (2018),"
“Education and training to end users”	“Somers and Nelson (2001),Murray and Coffin (2001),Soliman et al.(2001),Trimmer et al (2002),Akkermans and van Helden (2002),Nah et al (2003); ,Mabert and Venkataramanan (2003); ,Bradford and Florin (2003),Umble et al (2003),Wong and Tein (2003),Somers and Nelson (2004),Amoako-Gyampah (2004),Bhatti (2005),Chrusciel and Field (2006),Nah and Delgado (2006),Remus (2007),Yokota (2007,Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,Plant and Willcocks (2007),Woo (2007),Sawal et al (2008),Bradley (2008),Snider et al. (2009,Žabjek et al (2009),Bologa et al., (2009),Dezdar and Sulaiman (2009),Doom (2010),Supramaniam and Kuppusamy (2010),Shaul and Tauber (2010), Hairul, Nasir, and Sahibuddin (2011) ,Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Karande, Jain, and Ghatule (2012),Ram, Corkindale and Wu (2013),Al-Hinai, Edwards, and Humphries (2013) ,Kapur et al., (2014),Beheshti et al., 2014,Leyh (2014),(Olugbara, Kalema and Kekwaletswe 2014),Gandhi (2015),Leyh and Thomschke., 2015,Denolf et a., (2015),Al-Sabaawi 2015,Shatat (2015),Pecherskaya et al. (2015),Leyh (2016),Venkatraman and Fahd (2016),Nagpal, Kumar and Khatri (2017),(Aremu, Shahzad and Hassan 2018),Thompson, Olugbara and Singh (2018),Loonam et al. (2018),Reitsma and Hilletofth (2018),Hentschel, Leyh and Baumhauer 2019),"
“Education on future business processes”	“Shaul and Tauber (2010), Al-Hinai, Edwards, and Humphries (2013), Reitsma and Hilletofth (2018),”
“Adequate training to the implementation team”	“Karande, Jain, and Ghatule (2012), Al-Hinai, Edwards, and Humphries (2013),”
“Developing a clear education and training plan”	“Shaul and Tauber (2010), Al-Hinai, Edwards, and Humphries (2013), Reitsma and Hilletofth (2018),”
“Education on new business processes”	“Somers and Nelson (2001),Akkermans and van Helden (2002),Somers and Nelson (2004),Remus (2007),Plant and Willcocks (2007),Supramaniam and Kuppusamy (2010),Al-Hinai, Edwards, and Humphries (2013) ,Ahmad and Cuenca (2013),Kapur et al., (2014),Shatat (2015),Pecherskaya et al. (2015),Nagpal, Kumar and Khatri (2017),Reitsma and Hilletofth (2018),”
“Top management support”	“Somers and Nelson (2001),Murray and Coffin (2001), Esteves and Pastor (2001),Soliman et al.(2001),Fui-Hoon Nah et al. (2001),Xu et al (2002); ,Trimmer et al (2002),Akkermans and van Helden (2002),Allen and Havenhand (2002),Zhang et al. (2003,Sarker and Lee (2003); ,Nah et al (2003); ,Reimers (2003); ,Mabert and Venkataramanan (2003); ,Kraemmerand et al (2003),Bradford and Florin (2003),Umble et al (2003),Wong and Tein (2003),Somers and Nelson (2004),Bajwa et al. (2004,Zhang et al (2005),Yingjie (2005); ,Ward et al (2005),Motwani et al (2005),Ehie and Madsen (2005),Bhatti (2005),Gargeya and Brady (2005),Jafari et al. (2006,Li and Lin 2006,Remus (2006); ,King and Burgess (2006),Chrusciel and Field (2006),Soja (2006),Nah and Delgado (2006),Remus

	(2007),Yokota (2007,Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,Finney and Corbett (2007),Plant and Willcocks (2007),Woo (2007),Aloini, Dulmin and Mininno (2007),Sawal et al (2008), Muscatello and chen (2008), Dawson and Owens (2008),Bradley (2008),Ngai, Law, and Wat (2008),Seidel and Back (2009,Sumner and Bradley (2009,Sammon et al. (2009,Snider et al. (2009,Françoise (2009),Žabjek et al (2009),Rabaa'i (2009),Liu and Seddon (2009) ,Bologa et al., (2009),Dezdar and Sulaiman (2009),Mehrjerdi 2010,Hanafizadeh et al., 2010,Dey et al.,(2010),Ganesh and Mehta 2010,Doom (2010),Supramaniam and Kuppusamy (2010),Shaul and Tauber (2010),Garg (2010),(Al-Fawaz, Eldabi and Naseer 2010),(Abdelghaffar and Azim 2010),Koh et al. (2011),Dantes and Hasibuan (2011) ,ALdayel, Aldayel, and Al-Mudimigh (2011),Al-Fawaz, Eldabi and Kamal (2011), Hairul, Nasir, and Sahibuddin (2011) ,Chockalingam and Ramayah (2012),Schniederjans and Yadav (2012),Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Ahmad et al., (2012),Karande, Jain, and Ghatule (2012),Ziemba and Oblak, 2013,AlSudairi (2013),Al-Hinai, Edwards, and Humphries (2013) ,García, Rivera and Iniesta (2013),Lawrence et al., (2013),Ahmad and Cuenca (2013),Hart, and Snaddon, 2014,Kapur et al., (2014),Alias et al 2014,Beheshti et al., 2014, Abdelghaffar and Azim, (2010), Leyh, (2014), Leyh, (2016),,(Olugbara, Kalema and Kekwaletswe 2014),Gandhi (2015),Sun et al., 2015,Leyh and Thomschke., 2015,Denolf et a., (2015),Bintoro et al., 2015,Micheal Fripom (2015),Al-Sabaawi 2015,Shatat (2015),Pecherskaya et al. (2015),Ashja (2015),Leyh (2016),Venkatraman and Fahd (2016),Saade and Nijher (2016),Nagpal, Kumar and Khatri (2017),Saxena et al., 2017,Campos Fernandes Leandro et al. (2017),Soliman and Karia (2017),Ahmed, Shaikh, and Sarim (2017),Al-Hadi and Al-Shaibany (2017),(Aremu, Shahzad and Hassan 2018),Thompson, Olugbara and Singh (2018),Loonam et al. (2018),Reitsma and Hilletofth (2018),Hentschel, Leyh and Baumhauer 2019),"
“Management and project steering committees”	“Somers and Nelson (2001),Akkermans and van Helden (2002),Reimers (2003); ,Mabert and Venkataramanan (2003); ,Somers and Nelson (2004),Remus (2007),Plant and Willcocks (2007),Bradley (2008),Shaul and Tauber (2010),Garg (2010),Ram, Corkindale and Wu (2013),Ahmad and Cuenca (2013),Kapur et al., (2014),Leyh (2014),Leyh and Thomschke., 2015,Pecherskaya et al. (2015),Leyh (2016),Nagpal, Kumar and Khatri (2017),Loonam et al. (2018),”
“management leadership”	"Al-Mashari, Al-Mudimigh and Zairi (2003),Motwani et al (2005),Yokota (2007,Aloini, Dulmin and Mininno (2007),Hanafizadeh et al., 2010, Hairul, Nasir, and Sahibuddin (2011) ,Al-Hinai, Edwards, and Humphries (2013) ,García, Rivera and Iniesta (2013),Ahmad and Cuenca (2013),Micheal Fripom (2015),"
“Willingness to become involved”	“Nah and Delgado (2006), Shaul and Tauber (2010),”
"Developing an understanding of the needs, capabilities & IT limitations"	“Bajwa et al. (2004), Shaul and Tauber (2010),”
“Exhibiting strong commitment”	“Li and Lin 2006, Nah and Delgado (2006), Sawal et al (2008), Shaul and Tauber (2010), Alias et al 2014,”
“Resolving political conflicts (Political influence)”	“Shaul and Tauber (2010), Ahmad and Cuenca (2013), (Olugbara, Kalema and Kekwaletswe 2014),”
“Willingness to adopt modern technologies/Adaption Mechanism”	“Amoako-Gyampah (2004), Iskanius(2009), Hanafizadeh et al., 2010, Shaul and Tauber (2010), Ahmad and Cuenca (2013), Sowan et al. (2017), (Aremu, Shahzad and Hassan 2018),”
“dedicated staff of vendor and institute for implementation”	“Al-Fawaz, Eldabi and Kamal (2011), Karande, Jain, and Ghatule (2012), Sun et al., 2015, Saxena et al., 2017,”
“Financial budget / funding Model”	"Trimmer et al (2002), Ehie and Madsen (2005), Soja (2006),Aloini, Dulmin and Mininno (2007),Seidel and Back (2009,(Al-Fawaz, Eldabi and Naseer 2010),Al-Fawaz, Eldabi and Kamal (2011), Hairul, Nasir, and Sahibuddin (2011) ,Alias et al 2014,(Olugbara, Kalema and Kekwaletswe 2014),Sun et al., 2015,Bintoro et al., 2015,Saade and Nijher (2016),Saxena et al., 2017,Ahmed, Shaikh, and Sarim (2017),Al-Hadi and Al-Shaibany (2017),(Aremu, Shahzad and Hassan 2018),"
“Business vision”	“Fui-Hoon Nah et al. (2001),Allen and Havenhand (2002),Nah et al (2003); ,Reimers (2003); ,Al-Mashari, Al-Mudimigh and Zairi (2003),Motwani et al (2005),Gargeya and Brady (2005),Nah and Delgado (2006),Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,Finney and Corbett (2007), Dawson and Owens (2008),Bradley (2008),Ngai, Law,

	and Wat (2008),Françoise (2009),Rabaa'i (2009),Liu and Seddon (2009) ,Dezdar and Sulaiman (2009),Hanafizadeh et al., 2010,Ganesh and Mehta 2010,Doom (2010),Shaul and Tauber (2010),ALdayel, Aldayel, and Al-Mudimigh (2011),Ahmad et al., (2012),Ram, Corkindale and Wu (2013),Lawrence et al., (2013),Hart, and Snaddon, 2014,Denolf et a., (2015),Micheal Fripom (2015),Al-Sabaawi 2015,Shatat (2015),Pecherskaya et al. (2015),Ashja (2015),Saxena et al., 2017,Campos Fernandes Leandro et al. (2017),Loonam et al. (2018),Hentschel, Leyh and Baumhauer 2019),"
"Project mission / goals (Clear Goals and Objective)"	"Somers and Nelson (2001),Akkermans and van Helden (2002),Kraemmerand et al (2003),Somers and Nelson (2004),Bhatti (2005),Jafari et al. (2006,Remus (2006); ,King and Burgess (2006),Chrusciel and Field (2006),Soja (2006),Nah and Delgado (2006),Remus (2007),Yokota (2007,Plant and Willcocks (2007), Dawson and Owens (2008),Bradley (2008),Žabjek et al (2009),Bologa et al., (2009),Mehrjerdi 2010,Doom (2010),Supramaniam and Kuppusamy (2010),(Al-Fawaz, Eldabi and Naseer 2010),Dantes and Hasibuan (2011) ,Al-Fawaz, Eldabi and Kamal (2011), Hairul, Nasir, and Sahibuddin (2011) ,Chockalingam and Ramayah (2012),Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Ziemba and Oblak, 2013,Al-Hinai, Edwards, and Humphries (2013) ,García, Rivera and Iniesta (2013),Ahmad and Cuenca (2013),Kapur et al., (2014),Beheshti et al., 2014,Leyh (2014),(Olugbara, Kalema and Kekwaletswe 2014),Leyh and Thomschke., 2015,Shatat (2015),Pecherskaya et al. (2015),Ashja (2015),Leyh (2016),Saade and Nijher (2016),Nagpal, Kumar and Khatri (2017),Ahmed, Shaikh, and Sarim (2017),Al-Hadi and Al-Shaibany (2017),Loonam et al. (2018),Hentschel, Leyh and Baumhauer 2019),"
"beliefs on ERP (management, users, teams and managers)/ Perception"	"Bradford and Florin (2003), Amoako-Gyampah (2004),Chrusciel and Field (2006),Hanafizadeh et al., 2010,Chockalingam and Ramayah (2012),Al-Hinai, Edwards, and Humphries (2013) ,Alsoub et al. (2017),"
"Justification for investment in ERP (investment plan)"	"Soja (2006), Nah and Delgado (2006),"
"BPR"	"Somers and Nelson (2001),Murray and Coffin (2001), Esteves and Pastor (2001),Fui-Hoon Nah et al. (2001),Trimmer et al (2002),Akkermans and van Helden (2002),Allen and Havenhand (2002),Zhang et al. (2003,Nah et al (2003); ,Reimers (2003); ,Kraemmerand et al (2003),Al-Mashari, Al-Mudimigh and Zairi (2003),Wong and Tein (2003),Somers and Nelson (2004),Zhang et al (2005),Yingjie (2005); ,Motwani et al (2005),Ehie and Madsen (2005),Bhatti (2005),Gargeya and Brady (2005),Jafari et al. (2006,Remus (2006); ,Nah and Delgado (2006),Remus (2007),Yokota (2007,Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,Finney and Corbett (2007),Plant and Willcocks (2007),Woo (2007),Aloini, Dulmin and Mininno (2007),Helo et al 2008, Muscatello and chen (2008),Bradley (2008),Ngai, Law, and Wat (2008),Françoise (2009),Žabjek et al (2009),Rabaa'i (2009),Liu and Seddon (2009) ,Bologa et al., (2009),Dezdar and Sulaiman (2009),Hanafizadeh et al., 2010,Dey et al.,(2010),Ganesh and Mehta 2010,Supramaniam and Kuppusamy (2010),(Al-Fawaz, Eldabi and Naseer 2010),(Abdelghaffar and Azim 2010),Dezdar and Ainin 2011,Koh et al. (2011),Dantes and Hasibuan (2011) ,ALdayel, Aldayel, and Al-Mudimigh (2011),Al-Fawaz, Eldabi and Kamal (2011), Hairul, Nasir, and Sahibuddin (2011) ,Chockalingam and Ramayah (2012),Ahmad et al., (2012),Karande, Jain, and Ghatule (2012),AlSudairi (2013),Al-Hinai, Edwards, and Humphries (2013) ,Lawrence et al., (2013),Ahmad and Cuenca (2013),Ram et al.,(2014),Hart, and Snaddon, 2014,Kapur et al., (2014),Beheshti et al., 2014,Leyh (2014),(Olugbara, Kalema and Kekwaletswe 2014),Gandhi (2015),Leyh and Thomschke., 2015,Denolf et a., (2015),Bintoro et al., 2015,Shatat (2015),Pecherskaya et al. (2015),Ashja (2015),Leyh (2016),Venkatraman and Fahd (2016),Saade and Nijher (2016),Nagpal, Kumar and Khatri (2017),Saxena et al., 2017,Campos Fernandes Leandro et al. (2017),Soliman and Karia (2017),Sowan et al. (2017) ,Ahmed, Shaikh, and Sarim (2017),Thompson, Olugbara and Singh (2018),Loonam et al. (2018),Hentschel, Leyh and Baumhauer 2019),"
"User involvement"	"Soliman et al.(2001),Zhang et al. (2003,Reimers (2003); ,Kraemmerand et al (2003),Wong and Tein (2003),Zhang et al (2005),Yingjie (2005); ,Bhatti (2005),Chrusciel and Field (2006),Garcı ´a-Sa ´nchez and Pe ´rez-Bernal

	(2007,Woo (2007),Sawal et al (2008),Françoise (2009),Žabjek et al (2009),Bologa et al., (2009),Dezdar and Sulaiman (2009),Ganesh and Mehta 2010,Doom (2010),Shaul and Tauber (2010),(Al-Fawaz, Eldabi and Naseer 2010),Dantes and Hasibuan (2011) ,ALdayel, Aldayel, and Al-Mudimigh (2011),Al-Fawaz, Eldabi and Kamal (2011), Hairul, Nasir, and Sahibuddin (2011) ,Ziemba and Oblak, 2013,AlSudairi (2013),Ram, Corkindale and Wu (2013),Al-Hinai, Edwards, and Humphries (2013) ,Beheshti et al., 2014,Leyh (2014),(Olugbara, Kalema and Kekwaletswe 2014),Gandhi (2015),Leyh and Thomschke., 2015,Micheal Fripom (2015),Shatat (2015),Leyh (2016),Saxena et al., 2017,Thompson, Olugbara and Singh (2018),Loonam et al. (2018),Hentschel, Leyh and Baumhauer 2019),"
"User participation in the overall process approach"	"Wong and Tein (2003),Jafari et al. (2006,Žabjek et al (2009),Dezdar and Sulaiman (2009),Hanafizadeh et al., 2010,Shaul and Tauber (2010),(Al-Fawaz, Eldabi and Naseer 2010),ALdayel, Aldayel, and Al-Mudimigh (2011),Al-Fawaz, Eldabi and Kamal (2011),Ram, Corkindale and Wu (2013),Thompson, Olugbara and Singh (2018),"
"User uses the system according to guidance"	"Dezdar and Sulaiman (2009), Shaul and Tauber (2010), (Al-Fawaz, Eldabi and Naseer 2010),ALdayel, Aldayel, and Al-Mudimigh (2011), Al-Fawaz, Eldabi and Kamal (2011), Ram, Corkindale and Wu (2013),"
"Users' trust"	"Shaul and Tauber (2010), Schniederjans and Yadav (2012), (Olugbara, Kalema and Kekwaletswe 2014),"
"Key users' business knowledge"	"Wong and Tein (2003), Al-Hinai, Edwards, and Humphries (2013),"
"Appointment & availability of competent key users"	"Aloini, Dulmin and Mininno (2007), Al-Hinai, Edwards, and Humphries (2013) , Ahmed, Shaikh, and Sarim (2017),"
"Using ERP to fulfill cross functional areas"	"Shaul and Tauber (2010), Al-Hinai, Edwards, and Humphries (2013),"
"End users' attitudes"	"Al-Hinai, Edwards, and Humphries (2013), García, Rivera and Iniesta (2013), (Olugbara, Kalema and Kekwaletswe 2014),"
"ERP System"	"Nah and Delgado (2006), Dezdar and Sulaiman (2009), Shaul and Tauber (2010),Al-Hinai, Edwards, and Humphries (2013) ,"
"Level of Customization"	"Somers and Nelson (2001),Murray and Coffin (2001),Fui-Hoon Nah et al. (2001),Akkermans and van Helden (2002),Nah et al (2003); ,Wong and Tein (2003),Somers and Nelson (2004),Gargeya and Brady (2005),Soja (2006),Yokota (2007,Finney and Corbett (2007),Plant and Willcocks (2007), Dawson and Owens (2008),Bradley (2008),Françoise (2009),Žabjek et al (2009),Rabaa'i (2009),Bologa et al., (2009),Dezdar and Sulaiman (2009),Hanafizadeh et al., 2010,Supramaniam and Kuppusamy (2010),Shaul and Tauber (2010),(Al-Fawaz, Eldabi and Naseer 2010),ALdayel, Aldayel, and Al-Mudimigh (2011),Al-Fawaz, Eldabi and Kamal (2011),Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Ram, Corkindale and Wu (2013),Ahmad and Cuenca (2013),Hart, and Snaddon, 2014,Kapur et al., (2014),Beheshti et al., 2014,(Olugbara, Kalema and Kekwaletswe 2014),Bintoro et al., 2015,Micheal Fripom (2015),Shatat (2015),Pecherskaya et al. (2015),Venkatraman and Fahd (2016),Saade and Nijher (2016),Nagpal, Kumar and Khatri (2017),Saxena et al., 2017,Campos Fernandes Leandro et al. (2017),Thompson, Olugbara and Singh (2018),Loonam et al. (2018),Reitsma and Hilletofth (2018),"
"System flexibility to changing conditions"	"Hanafizadeh et al., 2010, Shaul and Tauber (2010), Olugbara, Kalema and Kekwaletswe (2014),"
"System integration"	"Nah et al (2003); ,Al-Mashari, Al-Mudimigh and Zairi (2003),Wong and Tein (2003),Bajwa et al. (2004,Nah and Delgado (2006),Helo et al 2008,Rabaa'i (2009),Dezdar and Sulaiman (2009),Dey et al.,(2010),Shaul and Tauber (2010),ALdayel, Aldayel, and Al-Mudimigh (2011),Ahmad et al., (2012),Ram, Corkindale and Wu (2013),Ram et al.,(2014),Saade and Nijher (2016),Sowan et al. (2017) ,Thompson, Olugbara and Singh (2018),"
"Systems reliability"	"Soja (2006),Dezdar and Sulaiman (2009),Shaul and Tauber (2010),Ahmed, Shaikh, and Sarim (2017),Loonam et al. (2018),"
"System interoperability"	"Shaul and Tauber (2010), Alsoub et al. (2017),"
"System cross functionality"	"Shaul and Tauber (2010), Al-Hinai, Edwards, and Humphries (2013),"

System testing”	“Al-Mashari, Al-Mudimigh and Zairi (2003),Finney and Corbett (2007),Helo et al 2008,(Al-Fawaz, Eldabi and Naseer 2010),Al-Fawaz, Eldabi and Kamal (2011),Schniederjans and Yadav (2012),Ahmad et al., (2012),García, Rivera and Iniesta (2013),Lawrence et al., (2013),Leyh (2014),Leyh and Thomschke., 2015,Denolf et a., (2015),Leyh (2016),Venkatraman and Fahd (2016),Loonam et al. (2018),”
System quality”	“Bajwa et al. (2004), Zhang et al (2005), Dezdar and Sulaiman (2009),Ganesh and Mehta 2010,Al-Fawaz, Eldabi and Kamal (2011),Ram, Corkindale and Wu (2013),Al-Hinai, Edwards, and Humphries (2013) ,”
Systems Changes and Upgrade”	(Olugbara, Kalema and Kekwaletswe 2014),”
System support”	“Shaul and Tauber (2010), Reitsma and Hilletofth (2018),”
ERP Version”	“Micheal Fripom (2015),”
ERP ease of use/complexity”	“Amoako-Gyampah (2004),Hanafizadeh et al., 2010,Hairul, Nasir, and Sahibuddin (2011) ,Schniederjans and Yadav (2012),Al-Hinai, Edwards, and Humphries (2013) ,(Olugbara, Kalema and Kekwaletswe 2014),Alsoub et al. (2017),Saxena et al., 2017,Sowan et al. (2017) ,”
ERP usefulness”	“Hanafizadeh et al., 2010, Al-Hinai, Edwards, and Humphries (2013), Olugbara, Kalema and Kekwaletswe (2014), Saade and Nijher (2016), Sowan et al. (2017) “
ERP easy to learn (Learnability/ awareness)”	“Al-Hinai, Edwards, and Humphries (2013), (Olugbara, Kalema and Kekwaletswe 2014), Shatat (2015),”
“Vanilla ERP”	“Finney and Corbett (2007), Dawson and Owens (2008),Liu and Seddon (2009) ,Ganesh and Mehta 2010,Ahmad et al., (2012),Ram, Corkindale and Wu (2013),Al-Hinai, Edwards, and Humphries (2013) ,Lawrence et al., (2013),Saxena et al., 2017,Loonam et al. (2018),”
“Suitability of software and hardware considerations”	“Zhang et al. (2003,Bradford and Florin (2003),Bajwa et al. (2004,Zhang et al (2005),Yingjie (2005); ,Jafari et al. (2006,Shaul and Tauber (2010),(Olugbara, Kalema and Kekwaletswe 2014),Micheal Fripom (2015),Alsoub et al. (2017),(Aremu, Shahzad and Hassan 2018),”
“IT Infrastructure”	"Akkermans and van Helden (2002),Mabert and Venkataramanan (2003); ,Ehie and Madsen (2005),Bhatti (2005),Li and Lin 2006,Soja (2006),Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,Finney and Corbett (2007),Aloini, Dulmin and Mininno (2007),Žabjek et al (2009),Liu and Seddon (2009) ,Ganesh and Mehta 2010,(Abdelghaffar and Azim 2010),Dantes and Hasibuan (2011) ,Al-Fawaz, Eldabi and Kamal (2011), Hairul, Nasir, and Sahibuddin (2011) ,Schniederjans and Yadav (2012),Ahmad et al., (2012),AlSudairi (2013),Al-Hinai, Edwards, and Humphries (2013) ,Lawrence et al., (2013),Hart, and Snaddon, 2014,Leyh (2014),(Olugbara, Kalema and Kekwaletswe 2014),Leyh and Thomschke., 2015,Bintoro et al., 2015,Al-Sabaawi 2015,Leyh (2016),Alsoub et al. (2017),Saxena et al., 2017,Campos Fernandes Leandro et al. (2017),Sowan et al. (2017) ,Ahmed, Shaikh, and Sarim (2017),Loonam et al. (2018),"
“software configuration”	“Allen and Havenhand (2002),Liu and Seddon (2009) ,Ganesh and Mehta 2010,Ahmad et al., (2012),Ram, Corkindale and Wu (2013),Lawrence et al., (2013),Ahmad and Cuenca (2013),Leyh (2014),Leyh and Thomschke., 2015,Denolf et a., (2015),Micheal Fripom (2015),Leyh (2016),Venkatraman and Fahd (2016),Saxena et al., 2017,Loonam et al. (2018),”
“Environment”	“Bradford and Florin (2003), Shaul and Tauber (2010),Leyh (2014),(Olugbara, Kalema and Kekwaletswe 2014),Sun et al., 2015,Leyh and Thomschke., 2015,Leyh (2016),”
“Opportunities for growth”	“Shaul and Tauber (2010),”

“Competition in industry/trend”	“Bradford and Florin (2003), Bajwa et al. (2004,Shaul and Tauber (2010),ALdayel, Aldayel, and Al-Mudimigh (2011),Ram et al.,(2014),Saxena et al., 2017,Ahmed, Shaikh, and Sarim (2017),”
“External/stakeholder pressure”	“Bajwa et al. (2004), Shaul and Tauber (2010), Ahmad et al., (2012),”
“Competitors’ adoption of ERP”	“Shaul and Tauber (2010), Ahmed, Shaikh, and Sarim (2017),”
“Uncertainty about environment”	“Bradford and Florin (2003), Li and Lin 2006, Shaul and Tauber (2010), Bintoro et al., 2015,”
“Data Management”	“Esteves and Pastor (2001),Akkermans and van Helden (2002),Mabert and Venkataramanan (2003); ,Umble et al (2003),Somers and Nelson (2004),Sun et al. (2005,Nah and Delgado (2006),Remus (2007),Finney and Corbett (2007),Plant and Willcocks (2007),Ngai, Law, and Wat (2008),Ganesh and Mehta 2010,Shaul and Tauber (2010),Dantes and Hasibuan (2011) ,Ram, Corkindale and Wu (2013),Ahmad and Cuenca (2013),(Olugbara, Kalema and Kekwaletswe 2014),Sun et al., 2015,Leyh and Thomschke., 2015,Denolf et a., (2015),Shatat (2015),Pecherskaya et al. (2015),Nagpal, Kumar and Khatri (2017),Saxena et al., 2017,(Aremu, Shahzad and Hassan 2018),Thompson, Olugbara and Singh (2018),Loonam et al. (2018),”
“Data analysis Plan’	“Somers and Nelson (2001),Akkermans and van Helden (2002),Somers and Nelson (2004),Remus (2007),Finney and Corbett (2007),Plant and Willcocks (2007),Shaul and Tauber (2010),Dantes and Hasibuan (2011) ,Chockalingam and Ramayah (2012),Ram, Corkindale and Wu (2013),Ahmad and Cuenca (2013),Kapur et al., (2014),(Olugbara, Kalema and Kekwaletswe 2014),Shatat (2015),Pecherskaya et al. (2015),Nagpal, Kumar and Khatri (2017),Sowan et al. (2017) ,”
“Data model is compatible with data requirements”	“Shaul and Tauber (2010),”
“Data quality control”	“Shaul and Tauber (2010), Koh et al. (2011), Olugbara, Kalema and Kekwaletswe (2014), Saade and Nijher (2016), Sowan et al. (2017), Ahmed, Shaikh, and Sarim (2017), Loonam et al. (2018),”
“Developing a plan for migrating and cleaning up data”	“Shaul and Tauber (2010), Dantes and Hasibuan (2011),Venkatraman and Fahd (2016), Saade and Nijher (2016),Hentschel, Leyh and Baumhauer 2019),”
“Data conversion Plan”	“Somers and Nelson (2001),Akkermans and van Helden (2002),Reimers (2003); ,Mabert and Venkataramanan (2003); ,Somers and Nelson (2004),Nah and Delgado (2006),Remus (2007),Finney and Corbett (2007),Plant and Willcocks (2007),Ganesh and Mehta 2010,Shaul and Tauber (2010),Koh et al. (2011),Chockalingam and Ramayah (2012),Ahmad et al., (2012),Ram, Corkindale and Wu (2013),Lawrence et al., (2013),Ahmad and Cuenca (2013),Kapur et al., (2014),(Olugbara, Kalema and Kekwaletswe 2014),Shatat (2015),Pecherskaya et al. (2015),Nagpal, Kumar and Khatri (2017),Loonam et al. (2018),”
“Selection of data to be converted”	“Nah and Delgado (2006), Ahmad and Cuenca (2013),”
“Data accuracy and integrity”	“Zhang et al. (2003,Umble et al (2003),Zhang et al (2005),Jafari et al. (2006,Chrusciel and Field (2006),Finney and Corbett (2007),Hanafizadeh et al., 2010,Shaul and Tauber (2010),Schniederjans and Yadav (2012),Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Ahmad et al., (2012),Lawrence et al., (2013),Micheal Fripom (2015),Saade and Nijher (2016),Campos Fernandes Leandro et al. (2017),
“Package selection”	Somers and Nelson (2001),Fui-Hoon Nah et al. (2001),Akkermans and van Helden (2002),Reimers (2003); ,Al-Mashari, Al-Mudimigh and Zairi (2003),Wong and Tein (2003),Somers and Nelson (2004),Remus (2006); ,Nah and Delgado (2006),Remus (2007),Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,Finney and Corbett (2007),Plant and Willcocks (2007),Aloini, Dulmin and Mininno (2007),Helo et al 2008, Muscatello and chen (2008),Rabaa'i (2009),Liu and Seddon (2009) ,Dezdar and Sulaiman (2009),Mehrjerdi 2010,Hanafizadeh et al., 2010,Ganesh and Mehta 2010,Supramaniam and Kuppusamy (2010),Shaul and Tauber (2010),Garg (2010),(Al-Fawaz, Eldabi and

	Naseer 2010),Upadhyay et al 2011,Dantes and Hasibuan (2011) ,ALdayel, Aldayel, and Al-Mudimigh (2011),Al-Fawaz, Eldabi and Kamal (2011),Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012),Karande, Jain, and Ghatule (2012),Ram, Corkindale and Wu (2013),Lawrence et al., (2013),Ahmad and Cuenca (2013),Hart, and Snaddon, 2014,Denolf et a., (2015),Ashja (2015),Venkatraman and Fahd (2016),Saade and Nijher (2016),Nagpal, Kumar and Khatri (2017),Ahmed, Shaikh, and Sarim (2017),Loonam et al. (2018),”
“Careful and professional package selection process/modules”	“Somers and Nelson (2001),Somers and Nelson (2004),King and Burgess (2006),Nah and Delgado (2006),Seidel and Back (2009,Dezdar and Sulaiman (2009),Shaul and Tauber (2010),Karande, Jain, and Ghatule (2012),Ram, Corkindale and Wu (2013),Ahmad and Cuenca (2013),Kapur et al., (2014),Pecherskaya et al. (2015),Ashja (2015),Nagpal, Kumar and Khatri (2017),Ahmed, Shaikh, and Sarim (2017),Loonam et al. (2018),”
"Fit between ERP and business process, information needs and strategic goals/ multi-site issues"	“Umble et al (2003),Bajwa et al. (2004,Sun et al. (2005,Sawal et al (2008),Helo et al 2008,Sammon et al. (2009,Hanafizadeh et al., 2010,Shaul and Tauber (2010),Schniederjans and Yadav (2012),Ahmad et al., (2012),Al-Hinai, Edwards, and Humphries (2013) ,Leyh (2014),Gandhi (2015),Leyh and Thomschke., 2015,Ashja (2015),Leyh (2016),Saade and Nijher (2016),Ahmed, Shaikh, and Sarim (2017),Al-Hadi and Al-Shaibany (2017),”
“Planning the package selection process”	“Shaul and Tauber (2010), Ahmad and Cuenca (2013),”
“Software development”	“Ngai, Law, and Wat (2008),Hanafizadeh et al., 2010, Shaul and Tauber (2010), Olugbara, Kalema and Kekwaletswe (2014),”
“Developing a plan for testing interfaces with integrated legacy systems”	“Esteves and Pastor (2001),Soliman et al.(2001),Soja (2006),Nah and Delgado (2006),Ngai, Law, and Wat (2008),Shaul and Tauber (2010),Schniederjans and Yadav (2012),Karande, Jain, and Ghatule (2012),Venkatraman and Fahd (2016),”
“Developing proper troubleshooting tools / Troubleshooting/crises management”	“Allen and Havenhand (2002),Nah et al (2003); ,Reimers (2003); ,Nah and Delgado (2006),Yokota (2007,Finney and Corbett (2007),Ngai, Law, and Wat (2008),Françoise (2009),Liu and Seddon (2009) ,Ganesh and Mehta 2010,Shaul and Tauber (2010),Ahmad et al., (2012),Lawrence et al., (2013),Alias et al 2014,(Olugbara, Kalema and Kekwaletswe 2014),Campos Fernandes Leandro et al.(2017),Ahmed, Shaikh, and Sarim (2017),Loonam et al. (2018),”
“Robustness and Error Prevention (Working closely with vendors and consultants to resolve software problems and troubleshooting errors)”	“Nah et al (2003), Rabaa'i (2009), Hanafizadeh et al., 2010, Shaul and Tauber (2010), Olugbara, Kalema and Kekwaletswe (2014), Sowan et al. (2017) ,”
“Developing proper troubleshooting skills and techniques for the IT workers”	“Shaul and Tauber (2010), Hairul, Nasir, and Sahibuddin (2011), Olugbara, Kalema and Kekwaletswe (2014), Reitsma and Hilletofth (2018),”
“Planning and Establishing Software development, testing and troubleshooting architecture”	“Fui-Hoon Nah et al. (2001),Wong and Tein (2003),Motwani et al (2005),Gargeya and Brady (2005),Garcı´a-Sa´nchez and Pe´rez-Bernal (2007,Bradley (2008),Dezdar and Sulaiman (2009),Shaul and Tauber (2010),Schniederjans and Yadav (2012),Hart, and Snaddon, 2014,Denolf et a., (2015),Micheal Fripom (2015),Pecherskaya et al. (2015),Venkatraman and Fahd (2016),Sowan et al. (2017) ,Thompson, Olugbara and Singh (2018),Reitsma and Hilletofth (2018),”
“Appropriate modeling methods and Techniques (pre-implementation analysis) / Necessary preconditions”	"Nah et al (2003), Soja (2006), Nah and Delgado (2006),Aloini, Dulmin and Mininno (2007),Seidel and Back (2009, Hairul, Nasir, and Sahibuddin (2011), Ram, Corkindale and Wu (2013), García, Rivera and Iniesta (2013), Leyh (2014),Leyh (2016),Venkatraman and Fahd (2016),Reitsma and Hilletofth (2018),"
“Configuration of overall ERP architecture”	“Remus (2006), Nah and Delgado (2006),Aloini, Dulmin and Mininno (2007), Hairul, Nasir, and Sahibuddin (2011) ,Chockalingam and Ramayah (2012),Micheal Fripom (2015),Pecherskaya et al. (2015),”

“Monitoring management”	“Fui-Hoon Nah et al. (2001),Xu et al (2002); ,Allen and Havenhand (2002),Nah et al (2003); ,Reimers (2003); ,Kraemmerand et al (2003),Wong and Tein (2003),Bajwa et al. (2004,Remus (2006); ,Soja (2006),Nah and Delgado (2006),Bradley (2008),Rabaa'i (2009),Shaul and Tauber (2010),(Al-Fawaz, Eldabi and Naseer 2010),(Abdelghaffar and Azim 2010),Al-Fawaz, Eldabi and Kamal (2011), Hairul, Nasir, and Sahibuddin (2011) ,Ziemba and Oblak, 2013,Al-Hinai, Edwards, and Humphries (2013) ,Ahmad and Cuenca (2013),Alias et al 2014,Sun et al., 2015,Micheal Fripom (2015),Shatat (2015),Saade and Nijher (2016),Campos Fernandes Leandro et al. (2017),Ahmed, Shaikh, and Sarim (2017),”
“Monitoring and evaluation of performance metrics (fast effects)”	“Fui-Hoon Nah et al. (2001),Mabert and Venkataramanan (2003); ,Al-Mashari, Al-Mudimigh and Zairi (2003),Wong and Tein (2003),Motwani et al (2005),Gargeya and Brady (2005),Soja (2006),Nah and Delgado (2006),Bradley (2008),Françoise (2009),Hanafizadeh et al., 2010,Shaul and Tauber (2010),(Al-Fawaz, Eldabi and Naseer 2010),Al-Fawaz, Eldabi and Kamal (2011), Hairul, Nasir, and Sahibuddin (2011) ,Ram, Corkindale and Wu (2013),Al-Hinai, Edwards, and Humphries (2013) ,Ahmad and Cuenca (2013),Hart, and Snaddon, 2014,Leyh (2014),Denolf et a., (2015),Bintoro et al., 2015,Micheal Fripom (2015),Shatat (2015),Leyh (2016),Saade and Nijher (2016),Campos Fernandes Leandro et al. (2017),Ahmed, Shaikh, and Sarim (2017),Reitsma and Hilletofth (2018),Hentschel, Leyh and Baumhauer 2019),"
“Monitoring progress against clear milestones”	“Nah and Delgado (2006), Shaul and Tauber (2010), Saade and Nijher (2016), Ahmed, Shaikh, and Sarim (2017),”
“User support organization and involvement”	“Nah et al (2003); ,Nah and Delgado (2006),Sawal et al (2008),(Al-Fawaz, Eldabi and Naseer 2010),Dantes and Hasibuan (2011) ,Al-Fawaz, Eldabi and Kamal (2011),Al-Hinai, Edwards, and Humphries (2013) ,Sykes 2015,Reitsma and Hilletofth (2018),”
“User friendliness, Help, and Documentation/Document ERP success”	“Soliman et al. (2001), Ganesh and Mehta 2010, (Olugbara, Kalema and Kekwaletswe 2014),Saade and Nijher (2016), Sowan et al. (2017) ,”
“User acceptance feedback management/Analysis of user feedback (user satisfaction/ satisfaction and system satisfaction)”	"Allen and Havenhand (2002),Nah et al (2003); ,Reimers (2003); ,Zhang et al (2005),Remus (2006); ,Chrusciel and Field (2006),Nah and Delgado (2006),Hanafizadeh et al., 2010,Shaul and Tauber (2010), Hairul, Nasir, and Sahibuddin (2011) ,Alias et al 2014,Leyh (2014),(Olugbara, Kalema and Kekwaletswe 2014),Sun et al., 2015,Leyh and Thomschke., 2015,Bintoro et al., 2015,Leyh (2016),Saade and Nijher (2016),Alsoub et al. (2017),Campos Fernandes Leandro et al. (2017),Ahmed, Shaikh, and Sarim (2017),Hentschel, Leyh and Baumhauer 2019),"
“Enforce project timeliness /Timeframe”	“Nah et al (2003); ,Reimers (2003); ,Nah and Delgado (2006),Liu and Seddon (2009) ,Hanafizadeh et al., 2010,Ganesh and Mehta 2010,(Al-Fawaz, Eldabi and Naseer 2010),Al-Fawaz, Eldabi and Kamal (2011),Ahmad et al., (2012),Lawrence et al., (2013),Alias et al 2014,Gandhi (2015),Bintoro et al., 2015,”
“Coordinate project activities”	“Nah and Delgado (2006),”
“Track milestones and targets”	“Nah et al (2003), Nah and Delgado (2006), Chockalingam and Ramayah (2012), Campos Fernandes Leandro et al. (2017),”
“Implementation experience/ with ERP implementation in similar scope”	“Soja (2006), Al-Hinai, Edwards, and Humphries (2013), García, Rivera and Iniesta (2013),”
“Appropriate business and legacy systems including building a business case”	“Fui-Hoon Nah et al. (2001),Nah et al (2003); ,Reimers (2003); ,Mabert and Venkataramanan (2003); ,Wong and Tein (2003),Gargeya and Brady (2005),Garcı ´a-Sa ´nchez and Pe ´rez-Bernal (2007,Finney and Corbett (2007),

	Dawson and Owens (2008),Bradley (2008),Dezdar and Sulaiman (2009),Koh et al. (2011),Al-Fawaz, Eldabi and Kamal (2011),Ahmad et al., (2012),Ram, Corkindale and Wu (2013),Lawrence et al., (2013),Hart, and Snaddon, 2014,(Olugbara, Kalema and Kekwaletswe 2014),Shatat (2015),Ashja (2015),Thompson, Olugbara and Singh (2018),Loonam et al. (2018),”
“Post-implementation evaluation/audit”	“Finney and Corbett (2007),Rabaa'i (2009),Hanafizadeh et al., 2010,Ganesh and Mehta 2010,Ahmad et al., (2012),Lawrence et al., (2013),Sun et al., 2015,Saade and Nijher (2016),Thompson, Olugbara and Singh (2018),Loonam et al. (2018),”
“Client consultation”	“Allen and Havenhand (2002), Reimers (2003), Finney and Corbett (2007), Ganesh and Mehta 2010, Ahmad et al., (2012), Lawrence et al., (2013),Pecherskaya et al. (2015),Saxena et al., 2017,”
“Social influence”	“Al-Hinai, Edwards, and Humphries (2013), Alsoub et al. (2017),”
“Availability of reliable data networks”	“Al-Hinai, Edwards, and Humphries (2013),Olugbara, Kalema and Kekwaletswe (2014),Sowan et al. (2017) ,”
“standardization and process measurement”	“García, Rivera and Iniesta (2013),Olugbara, Kalema and Kekwaletswe (2014),Bintoro et al., 2015,Micheal Fripom (2015),Sowan et al. (2017) ,”
“Follow the PDCA cycle”	“García, Rivera and Iniesta (2013),”
“System’s Response Time to Users’ Requests”	“Olugbara, Kalema and Kekwaletswe (2014),”
“Interest/users groups”	“Bajwa et al. (2004), Olugbara, Kalema and Kekwaletswe (2014),”
“Policies and Standards/ Government policies/Model”	“Seidel and Back (2009), Abdelghaffar and Azim (2010), Ziemba and Oblak, 2013, Olugbara, Kalema and Kekwaletswe (2014),”
“Availability of applications (as result of Obsolescence of Hardware and Software)”	“Olugbara, Kalema and Kekwaletswe (2014),”
“Discipline/Base point analysis; Process discipline; benchmarking”	“Mabert and Venkataramanan (2003), Aloini, Dulmin and Mininno (2007), Snider et al. (2009), Hanafizadeh et al., 2010, Micheal Fripom (2015),Saade and Nijher (2016),Ahmed, Shaikh, and Sarim (2017),”
“Contingency plans (Co-ordinated analysis; contingency plans)”	“Dey et al.,(2010), Sun et al., 2015, Saade and Nijher (2016), Aremu, Shahzad and Hassan (2018),”
“Effective management techniques”	“Upadhyay et al., (2011), Ahmed, Shaikh, and Sarim (2017), Reitsma and Hilletofth (2018),”
“Controlled ROI on ERP implementation”	“Murray and Coffin (2001), Ahmed, Shaikh, and Sarim (2017),”
“Operational Efficiency”	“Loonam et al. (2018),”
“Internal readiness”	“Chrusciel and Field (2006), Loonam et al. (2018),”
“security of interface”	“Soliman et al. (2001), Hanafizadeh et al., 2010, Sun et al., 2015, Alsoub et al. (2017), Hentschel, Leyh and Baumhauer 2019),”
“Integrated department and solve the problem of human resources management. / Allocation of Best Internal Business Personnel”	“Xu et al (2002); ,Trimmer et al (2002),Sun et al. (2005,Ehie and Madsen (2005),Seidel and Back (2009,Sammon et al. (2009,Hanafizadeh et al., 2010,Saini et al.2013,Sun et al., 2015,Al-Hadi and Al-Shaibany (2017),”
“Cost of update/upgrade/maintenance and integration”	“Hanafizadeh et al., 2010, Alaskari, Ahmad, Dhafr, and Pinedo-Cuenca (2012), Venkatraman and Fahd (2016),
“Confidentiality”	“Venkatraman and Fahd (2016),”
“Feasibility /evaluation of ERP project”	“Ehie and Madsen (2005),”
“Strategic initiatives”	“Motwani et al (2005), Hanafizadeh et al., 2010,”

“stimuli (environmental and customer needs)”	“Bajwa et al. (2004), Motwani et al (2005), Sun et al., 2015, Alsoub et al. (2017),”
“ERP treated as a program not a project”	“Murray and Coffin (2001),”
“Technical task and tools/Factors”	“Yokota (2007), Seidel and Back (2009), Hairul, Nasir, and Sahibuddin (2011), Ahmad et al., (2012),”
“Reporting structure (project manager reporting to mgmt.”	“Sumner and Bradley (2009), Hairul, Nasir, and Sahibuddin (2011),”
“Required Organizational Buy-In and Project Ownership”	“Sammon et al. (2009), Hairul, Nasir, and Sahibuddin (2011),”
“Value Chain Connectivity”	“Bajwa et al. (2004), Ahmad et al., (2012),”
“IT provider and Integrator Push”	“Bajwa et al. (2004), Ahmad et al., (2012),”
“Globalization”	“Bintoro et al., 2015,”
“Procurement Management”	“Hanafizadeh et al., 2010, Ziemba and Oblak, 2013,””

APPENDIX D

"CSF	Description	Occurrences
F1	Vendor	4
F2	Selection of appropriate vendor	5
F3	ERP vendor characteristics /reputation	4
F4	Partnership with vendor	26
F5	Vendor support	33
F6	Use of vendors' tools	17
F7	Keeping suppliers and customers informed	5
F8	Project Management	71
F9	Project leader	9
F10	Appointment & availability of competent project manager	4
F11	project manager /Full time	8
F12	Scope creep Management (Detail schedule)	19
F13	Assign responsibility/ Clear roles & responsibilities	7
F14	control project scope	6
F15	Evaluate any propose change	3
F16	Control and assess scope expansion requests/ assessment	3
F17	Define project miles stones	1
F18	Set realistic milestone and end dates	3
F19	Knowledge transfer management	9
F20	Management of conflicts	2
F21	Management of legacy systems	18
F22	Clear and defined project plan	4
F23	Planning required upgrades	2
F24	Management of expectations	21
F25	Management of risks	14
F26	Effective project management methodology	7
F27	Project tracking	1
F28	Total quality management approach	9
F29	Interdepartmental communication and cooperation	81

F30	Open and honest communication (Targeted and effective communication, among stakeholders, expectations communicated at all level and progress communication)	15
F31	Professional training services	1
F32	Setting realistic deadlines	1
F33	Project Management to implement project plan	3
F34	Change management	70
F35	Change management program	18
F36	Understanding the political structure (Political influence)	4
F37	User participation in defying new processes	1
F38	Understanding the organizational culture / (norms, values & beliefs)	36
F39	Developing a culture of continuous improvement	5
F40	National culture	3
F41	Recognizing the need for change	4
F42	Commitment to change -perseverance and determination	4
F43	Project team competence (formulation, composition and involvement)	67
F44	Team finest cross functional knowledge /small internal team	11
F45	Trust between various shareholders	5
F46	Good relations between project team and users (Partnership, trust, risk-sharing and incentives)	14
F47	Team morale and motivation	18
F48	Full time team members	8
F49	Balanced and cross functional project team	16
F50	Allocating valuable resources/Dedicating resources	25
F51	Culture of resistance/ enabling constraints	8
F52	Counselling to staff to minimize resistance to change	6
F53	Staff retention	6
F54	Empowered decision makers	18
F55	Work time schedule	4
F56	Performance tied to compensation	7
F57	Availability of qualified implementation team	4
F58	Deep understanding strategy	1

F59	Organizational characteristics	5
F60	Former major change experience	1
F61	Having in place advanced technology	4
F62	Former major IT change experience/Previous organization's experience with complex IS	3
F63	Interdepartmental coordination/ company wide	9
F64	Organization transformation and software migration	1
F65	Clear organizational strategy	7
F66	Organization encouragement of continuous learning	2
F67	Organization structure	16
F68	Implementation strategy	16
F69	Project definition and organization	1
F70	Implementation promotion	2
F71	Consultant's domain knowledge & experience	7
F72	Appointment of consultant/ external consultant involve in implementation (third party)	12
F73	Managing consultants	3
F74	Use of consultants (Consultant selection and relationship)	42
F75	Decision making process style/Strategic Decision making	7
F76	Focused performance measures plan	5
F77	Planning the cost of ERP implementation-Project cost planning and management	11
F78	Regard as a technological, business, and organizational project	8
F79	Alignment between business strategy and IT strategy	17
F80	Ensuring fair time to fulfill the implementation	6
F81	Business change is first to be considered	1
F82	Architecture choices	10
F83	Functional requirements are clearly defined before deciding on ERP adaptation/country related/carefully defined information and system requirement	9
F84	Continues focus on organizational resistance	4
F85	Level of implementation acceleration	1
F86	Implementation approach	1
F87	Implementer's domain knowledge & experience	3
F88	Project champion	49

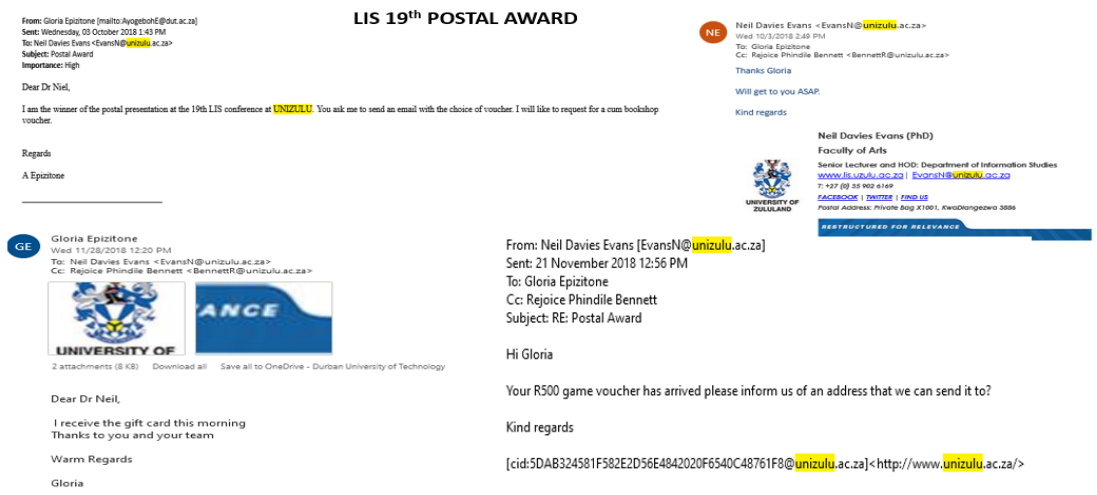
F89	Education and training	58
F90	Education and training to technical staff /IT workforce re-skilling	21
F91	Education and training to end users	48
F92	Education on future business processes	3
F93	Adequate training to the implementation team	2
F94	Developing a clear education and training plan	3
F95	Education on new business processes	11
F96	Top management support	105
F97	Management and project steering committees	17
F98	management leadership	10
F99	Willingness to become involved	2
F100	Developing an understanding of the needs, capabilities & IT limitations	2
F101	Exhibiting strong commitment	4
F102	Resolving political conflicts (Political influence)	3
F103	Willingness to adopt modern technologies/Adaption Mechanism	5
F104	dedicated staff of vendor and institute for implementation	4
F105	Financial budget / funding Model	16
F106	Business vision	37
F107	Project mission / goals (Clear Goals and Objective)	42
F108	beliefs on ERP (management, users, teams and managers)/ Perception	5
F109	Justification for investment in ERP (investment plan)	2
F110	BPR	79
F111	User involvement	38
F112	User participation in the overall process approach	11
F113	User uses the system according to guidance	6
F114	Users' trust	2
F115	Key users' business knowledge	2
F116	Appointment & availability of competent key users	3
F117	Using ERP to fulfill cross functional areas	2
F118	End users' attitudes	3
F119	ERP System	4
F120	Level of Customization	43
F121	System flexibility to changing conditions	3

F122	System integration	16
F123	Systems reliability	5
F124	System interoperability	1
F125	System cross functionality	2
F126	System testing	13
F127	System quality	7
F128	Systems Changes and Upgrade	1
F129	System support	2
F130	ERP Version	1
F131	ERP ease of use/complexity	7
F132	ERP usefulness	5
F133	ERP easy to learn (Learnability/ awareness)	3
F134	Vanilla ERP	10
F135	Suitability of software and hardware considerations	9
F136	IT Infrastructure	32
F137	software configuration	15
F138	Environment	7
F139	Opportunities for growth	1
F140	Competition in industry/trend	7
F141	External/stakeholder pressure	3
F142	Competitors' adoption of ERP	2
F143	Uncertainty about environment	4
F144	Data Management	24
F145	Data analysis Plan	14
F146	Data model is compatible with data requirements	1
F147	Data quality control	7
F148	Developing a plan for migrating and cleaning up data	5
F149	Data conversion Plan	20
F150	Selection of data to be converted	2
F151	Data accuracy and integrity	14
F152	Package selection	39
F153	Careful and professional package selection process/modules	15
F154	Fit between ERP and business process, information needs and strategic goals/ multi-site issues	15
F155	Planning the package selection process	2

F156	Software development	4
F157	Developing a plan for testing interfaces with integrated legacy systems	8
F158	Developing proper troubleshooting tools / Troubleshooting/crises management	18
F159	Robustness and Error Prevention (Working closely with vendors and consultants to resolve software problems and troubleshooting errors)	6
F160	Developing proper troubleshooting skills and techniques for the IT workers	4
F161	Planning and Establishing Software development, testing and troubleshooting architecture	17
F162	Appropriate modeling methods and Techniques (pre-implementation analysis) / Necessary preconditions	12
F163	Configuration of overall ERP architecture	7
F164	Monitoring management	28
F165	Monitoring and evaluation of performance metrics (fast effects)	31
F166	Monitoring progress against clear milestones	4
F167	User support organization and involvement	8
F168	User friendliness, Help, and Documentation/Document ERP success	5
F169	User acceptance feedback management/Analysis of user feedback (user satisfaction/ satisfaction and system satisfaction)	21
F170	Enforce project timeliness /Timeframe	12
F171	Coordinate project activities	1
F172	Track milestones and targets	3
F173	Implementation experience/ with ERP implementation in similar scope	3
F174	Appropriate business and legacy systems including building a business case	23
F175	Post-implementation evaluation/audit	10
F176	Client consultation	8
F177	Social influence	1
F178	Availability of reliable data networks	3
F179	standardization and process measurement	5
F180	Follow the PDCA cycle	1
F181	System’s Response Time to Users’ Requests	1
F182	Interest/users groups	2
F183	Policies and Standards/ Government policies/Model	4

F184	Availability of applications (as result of Obsolescence of Hardware and Software)	1
F185	Discipline/Base point analysis; Process discipline; benchmarking	7
F186	Contingency plans (Co-ordinated analysis; contingency plans)	3
F187	Effective management techniques	2
F188	Controlled ROI on ERP implementation	2
F189	Operational Efficiency	1
F190	Internal readiness	2
F191	security of interface	4
F192	Integrated department and solve the problem of human resources management. / Allocation of Best Internal Business Personnel	9
F193	Cost of update/upgrade/maintenance and integration	3
F194	Confidentiality	1
F195	Feasibility /evaluation of ERP project	1
F196	Strategic initiatives	2
F197	stimuli (environmental and customer needs)	3
F198	ERP treated as a program not a project	1
F199	Technical task and tools/Factors	4
F200	Reporting structure (project manager reporting to mgmt.	2
F201	Required Organizational Buy-In and Project Ownership	2
F202	Value Chain Connectivity	2
F203	IT provider and Integrator Push	2
F204	Globalization	1
F205	Procurement Management	2”

Source: Author



LIS 19th POSTAL AWARD

From: Gloria Epizitone [mailto:AyogebohE@dut.ac.za]
Sent: Wednesday, 03 October 2018 1:43 PM
To: Neil Davies Evans <EvansN@unizulu.ac.za>
Subject: Postal Award
Importance: High

Dear Dr Niel,

I am the winner of the postal presentation at the 19th LIS conference at UNIZULU. You ask me to send an email with the choice of voucher. I will like to request for a cum bookshop voucher.

Regards

A Epizitone

Neil Davies Evans <EvansN@unizulu.ac.za>
Wed 10/3/2018 2:49 PM
To: Gloria Epizitone
Cc: Rejoice Phindile Bennett <BennettR@unizulu.ac.za>

Thanks Gloria

Will get to you ASAP.

Kind regards

Neil Davies Evans (PhD)
Faculty of Arts
Senior Lecturer and HOD: Department of Information Studies
www.lis.uzulu.ac.za | EvansN@unizulu.ac.za
T: +27 (0) 35 902 6169
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Postal Address: Private Bag X1001, KwaDlangezwa 3886
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Gloria Epizitone
Wed 11/28/2018 12:20 PM
To: Neil Davies Evans <EvansN@unizulu.ac.za>
Cc: Rejoice Phindile Bennett <BennettR@unizulu.ac.za>

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Dear Dr Neil,

I receive the gift card this morning
Thanks to you and your team

Warm Regards

Gloria

From: Neil Davies Evans [EvansN@unizulu.ac.za]
Sent: 21 November 2018 12:56 PM
To: Gloria Epizitone
Cc: Rejoice Phindile Bennett
Subject: RE: Postal Award

Hi Gloria

Your R500 game voucher has arrived please inform us of an address that we can send it to?

Kind regards

[cid:5DAB324581F582E2D56E4842020F6540C48761F8@unizulu.ac.za]<http://www.unizulu.ac.za/>