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ASSESSING ERP SYSTEMS POST IMPLEMENTATION SUCCESS IN KENYAN CORPORATES

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Declaration

I declare that this project report is my original work except where due references are cited and to the best of my knowledge has not been submitted for any other University Award. Information from other sources has been acknowledged.

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APPROVAL

The project report has been submitted in partial fulfilment of the requirement of the award of Master of Science Degree in Computer Science of the University of Nairobi, with my approval as the University supervisor.

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Acknowledgements

Abstract

Enterprise Resource Planning Systems have gained widespread usage among Kenyan corporates and in order to achieve the many benefits ERP systems have to offers, an organization needs to achieve ERP post implementation success, which must be continually reviewed to address any emerging challenges. ERP systems implementations pose challenges to implementing organizations and sometimes end up in failure. Any ERP initiative can be viewed as a strategic investment adding value to the organizations' IS infrastructure and it should therefore be safeguarded. The problems associated with ERP implementations are most prevalent during the post-implementation phase.

This study was carried out on the ERP post implementation phase of a local corporate in Kenya and it sought to investigate factors that affect post implementation success of ERP systems, investigate what management should put in place so as to achieve post implementation success for ERP Systems and investigate the relationship between factors in the organisation's contextual environment and post implementation success of ERP Systems.

The research approach used were quantitative and qualitative. The study made use of questionnaires, targeted interviews, focused group discussions and data from ERP project. From the findings of the study, organizational, technological and environmental factors indirectly or directly impact post implementation success. Management will be empowered to evaluate ERP post implementation success of their organization based on the ERP experiences of the organization in the study and adopt the findings to make improvements for future ERP projects. Recommendations are drawn on probable ways to overcome existing ERP post implementation challenges and also to improve on ERP post implementation success.

In conclusion, the study recommends increased investments towards hardware and software upgrades, developing internal skilled expertise, firm policy on ERP usage, change management and proper human resource management as necessary drivers towards achieving ERP post implementation success.

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List of Abbreviations:

CSF: - Critical Success Factors

CSIP: - Continuous Service Improvement Process

ERP:-Enterprise Resource Planning

IS: - Information Systems

IT: - Information Technology

ITGI: - IT Governance Institute

PIS: - Post Implementation Success

ROI: - Return On Investment

LEs:-Large Sized Enterprises

Definition of important terms:

ERP System – It is a business process management software that allows an organization to use a system of integrated applications to manage the business and automate many back office functions related to technology, services and human resources.

Post implementation - This is the period after project implementation whereby the system is expected to address the specific business need the organization intended to meet.

CHAPTER 1: INTRODUCTION

1.0 Background

As information technology gets entrenched into the organizations business process, the IT environment becomes very complex to control and manage. IT is now inseparable to the organization resulting in challenges in strategically aligning IT objectives with business objectives. The organization requires a reliable, scalable and secure computing environment that will support the organizations processes and operations. Some of these systems are said to be mission-critical. Failure in a mission critical system results in business operations being significantly impacted.

Most ERP systems are integrated and availed as a package that seamlessly integrates all the operations in an organization like human resources, accounting, procurement, and customer data.

Pabedinskaitė (2009) notes that rollout of ERP systems is complex and is governed by technical factors and also other factors. ERP systems are an indication of the inseparability of the organization and IS and therefore should be implemented to ensure that the ERP delivers business value. However, research has mainly been done on the implementation stage of the ERP lifecycle. This research therefore aimed to explore the ERP at the post go-live phase to ensure promised success throughout system lifecycle of the ERP.

The research was designed to investigate the way an organization leverages ERP PIS as a driver towards the realization of an organization's performance improvement and other expected benefits that result from the decision of investing in and utilizing the ERP system.

To support their organization strategy, a corporate in Kenya has invested heavily in ERP systems. The deployment of ERP and other related services and integrations pose a great challenge in harnessing post implementation success and forces IS management to re-evaluate the way ERP systems are managed with an aim of achieving value delivery. The research thus focused on assessing ERP PIS factors in this selected local corporate.

1.1 Statement of the problem

ERP implementation poses a challenge to implementing organizations and ERP consultants. Parr and Shanks (2000) suggest that ERP is critical in meeting the overall business objectives, and therefore its implementation problems, roll-out issues and successes have been examined in the past. The problems associated with ERP implementations are most prevalent during the post-implementation phase because this is when the mistakes of the prior phases surface and become real Musaji (2005). Michael Donavan notes that it is normal for organizations to bite a big chunk with ERP systems but unfortunately, more than 90% of the organizations implementing the ERP's aren't successful the first time around.

Consequently, any ERP initiative can be viewed as a strategic investment adding value to the organizations' IS infrastructure and it should be safeguarded.

Organizations differ in their assimilation of IT applications. Similarly, ERP practices and ERP projects' outcomes could broadly differ across countries with different cultural contexts, different economies and different IT structures (Ngai et al., 2008; Huang and Palvia, 2001). Most ERP systems have been developed from the west and therefore have modules that are based on the developers' values and culture, and reflect the industry practices in those countries. This could easily clash with the adopting organizations' practices and norms, thereby raising issues and challenges.

Most of the research in ERP systems is focused on ERP experiences in developed countries. This provides grounds for the need for studies in less developed countries.

In order to fill in this research gap, a study to investigate determining factors for ERP post implementation success in corporates in a developing country like Kenya is needed.

1.2 Purpose of the study

The study aims to assist corporate organizations in Kenya as well as ERP implementers to ensure that ERP systems deliver their intended value to the organization. Most organizations don't look beyond the implementation phase of ERP systems, and therefore emphasis is not employed in managing the post-implementation phase of ERP systems. In light of the crucial role that ERP post implementation phase has on organizations, the study seeks to investigate the critical issues around ERP post implementation success.

1.3 Research Objectives

i. Identify the factors that affect the post-implementation success of ERP systems

ii. Investigate what management should put in place in order to achieve post implementation success of ERP Systems

iii. Investigate the relationship between factors in the organisation's contextual environment and post implementation success of ERP Systems

1.4 Research Questions

i. What are the determinant factors for ERP post implementation success from the user's point of view?

ii. Which post implementation factors influence the post implementation success of an ERP system and how significant are those factors?

iii. What is the relationship between the organization's contextual environment and post-implementation success of ERPs?

1.5 Assumptions of the study

The study assumes that the following conditions exist at the organizations under study:

a. The assumption of uniformity in the basic nature of the organization despite the fact that organizational structures may vary.

b. The local corporate chosen presents a typical business case research

1.6 Limitations of the study

The study is constrained by the following factors:

a. Limited finance restricts sample and resources to carry out the study

b. The short time available for the study limits the scope

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This chapter builds up the theory for the research by reviewing the work that has been done in relation to the topic of study. This literature review will focus on existing research on ERP post implementation success.

2.1 Enterprise Resource Planning (ERP)

Shanks, Seddon and Willcocks (2003) define ERP system as a packaged business system software that enables automation and integration of business processes and also provides a platform to share data across the enterprise.

ERP software enables the organization manage information in all areas of business and assist to manage organization-wide business procedures, using a central database and reporting tools. Business processes are tasks that take one or more kinds of input and produces outputs, such as report forecasts which is of value to the customer (Monk, E.F and Wagner B.J, 2009).

Balls et al. (2000) notes that ERP systems, if deployed fully throughout an organization, interconnects all components in the organization through sharing of data and logical transmissions.

2.2 Benefits of ERP

Shang and Seddon (2003), in Zhu et al. (2009), show that firms that adopt an ERP system have five categories of benefits: operational benefits, managerial benefits, strategic benefits, organizational benefits and IT infrastructural benefits. Zhu et al (2009) evaluated the post implementation of the ERP system through operational and managerial advantages. Operational benefits are expressed in terms of improved productivity, reduced costs, inventory-level reduction, and customer service enhancement.

Operational benefits:
By automating business processes and enabling process changes, they can offer benefits in terms of cost reduction, cycle term reduction, productivity improvement, quality improvement, and improved customer service.
Managerial benefits:
With centralized database and built-in data analysis capabilities, they can help an organization achieve better resource management, improved decision making and planning, and performance improvement.
Strategic benefits:
With large-scale business involvement and internal/external integration capabilities, they can assist in business growth, alliance, innovation, cost, differentiation, and external linkages.
IT infrastructure benefits:
With integrated and standard application architecture, they support business flexibility, reduced IT cost and marginal cost of business units' IT, and increased capability for quick implementation of new applications.
Organizational benefits:
They affect the growth of organizational capabilities by supporting organization structure change, facilitating employee learning, empowering workers, and building common visions.

Figure 2.1: Benefits of ERP

Source: Proposed enterprise system benefits framework (Seddon et al., 2003, p. 79)

2.3 Post implementation success of ERP

Critical success factors of ERP projects have been studied from different viewpoints (Nah et al., 2003). Researchers have identified many factors that could be important in the successful implementation of an ERP system. Somers and Nelson (2004) identified 22 CSF's including: Leadership support, Training on business processes and User training on application software. Al-Mashari et al. (2003) recognized 12 critical factors for ERP success: ERP identification, project management, education and user training, business process management, cultural and structural change management. Umble et al. (2003) segmented them into 10 groups including: Commitment by top leadership, understanding of organizational strategic goals, Exceptional project management, Skilled ERP implementation team, Successfully managing the technical issues, Organizational change management, accuracy of system data, Adequate training and user

education, Monitored measurement of performance and resolution of Multi-site issues. Markus & Tanis (2000), in (Zhu et al., 2009), highlighted four stages of an ERP project: the Chartering phase, the Project phase, the Shakedown phase, the Onward and upward phase.

This study aims to better understand the issues of ERP post implementation phase of the project, which starts at the use of the ERP upto when the decision is made to drop it or when it is replaced by another system and it usually happens after the Shakedown phase (Haekkinen & Hilmola, 2008).

Implementation of ERP should be considered as a continuous process so as to derive performance and business value from the ERP system (Esteves, 2009; Kouki et al., 2010). ERP implementation project should thus transition into the post implementation phase seamlessly (Markus et al., 2000). There have been few researchers reporting on the issues that come up in the post implementation stage even as previous successes indicate that the ERP system must be enhanced in the post implementation stage so as to maximize its value and thereby providing a competitive advantage for the business (Law et al., 2010; Wilson, 2012).

For optimization of the post implementation success of the ERP, organizations have to ensure focused and efficient use of the ERP in order to benefit from the ERP system (Al-Mashari et al., 2003; Zhu et al., 2010).

2.4 Challenges to ERP Post Implementation Success

Taking up and incorporating an ERP system is complex and a challenging organizational leaning process involving change management (Davenport, 1998). Challenges and risks of ERP projects are significantly increased due to the need for business process reengineering, great investment in human resources as well as time and material (Kumar et al., 2003). Achieving a quick and issue free adoption might indicate success but implementation quality may result in underutilization of the system and dissatisfaction among users (Markus et al., 2000).

Many organizations are experiencing ERP initiative failures in spite of attempts to decrease the amount of complexity of ERP systems and also the improvement of mid-range ERP's (Somers et al., 2000). Efficient system rollout is a necessary but not adequate prerequisite to fully gain the benefits of the ERP system. For significant business value to be gained, the innovation must be

intertwined in the organizations value chain before business value is obtained (Delone and McLean, 2003).

Davenport (1998) asserts that when organizations fail to harmonize their business systems and human requirements with those of the new system, there is a reason for ERP failure. The complexity of ERP systems and lack of ERP product knowledge also has links to ERP failure (Chang, 2004), the lack of proper project management, the lack of top leadership support, the lack of knowledgeable ERP support team for all the ERP modules within the organization, lack of well-defined objectives for the business, lack of proper communication, the use of poor project methodologies or lack of it, premature releasing of software, design-reality gaps for the organization and failure of change management in organization(Bagchi et al. , 2003 ; Umble et al. ,2003; Loh and Koh, 2004)

Markus et al. (2000) observed that many projects had been cut short in the post-implementation stage and sought to investigate the road blocks in an ERP life cycle. The ERP needs user acceptance in order to be delivered fully and properly. A major issue, however arises when users are unwilling to accept and give their commitment in rolling out the system (Markus et al., 2000; Kumar et al., 2003). This could be brought about by various issues like lack of training and education on system features and functionalities, lack of system documentation, user turnover leading to loss of people who are skilled, failure by organization to recruit the appropriate skills thereby leading to over reliance on the project team and support team (Markus et al., 2000; Kumar et al., 2003). Technology issues also introduce a major road block at the post implementation stage. Issues such as hardware failures, software bugs, data inconsistency and lack of proper system documentation hinder the achievement of the evolving business needs.

Musaji (2005) observed that the problems associated with ERP implementations are most prevalent during the post-implementation phase because this is when the mistakes of the prior phases surface and become real. The cost overruns and adverse business impacts in an organization during this phase can threaten the survival of the organization and impact sales revenue. There is therefore need for research that increases understanding of this phase in order to minimize the negative impacts and failure during this period.

Exploring the challenges of the post implementation phase is of increased importance as they are bound to eventually affect ERP post implementation success.

2.5 Theoretical Framework

2.5.1 The DeLone and McLean IS Success Model

The IS success model was reviewed by DeLone and McLean (2003) whereby they included a service quality dimension, coming up with a new net benefits dimension by integrating individual impact with organizational impact, they also added the dimension for intention to use. Inclusion of service quality to the model was advised by the organizational IS success research which found IS success quality dimensions system and information. Additionally, IS's were found to influence the organization, individual users and also organizational environment, society and consumers. The use of net benefits dimension provides for incorporating the IS impacts and also for the simplification of the model.
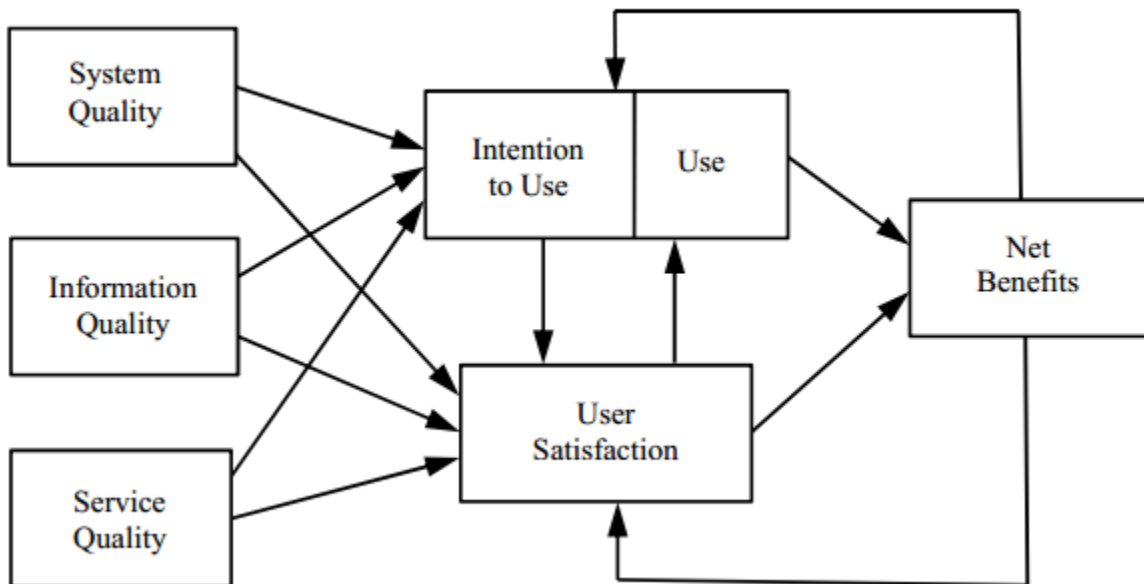
Figure 2.2: The revised DeLone and McLean IS success model

Source: The DeLone and McLean Model of Information Systems Success: A Ten-Year Update (DeLone and McLean, 2003, p. 87)

2.5.2 IS implementation framework

Organizational change is related to IS implementation since the implementation of IS caused change in the organization be it deliberate of unintentional. The role of organizational context in IS implementation is quite significant as envisaged by many IS researchers (Wausi and Waema, 2010). The context drives the information systems implementation process through engaging or constraining the information systems implementation process. Context may be swayed by the information systems implementation process. Therefore the context shows factors like leadership structures, influence, cultural, power and human resources around where the information systems implementation occurs and which forms the integral foundation for an interpretation of the process.
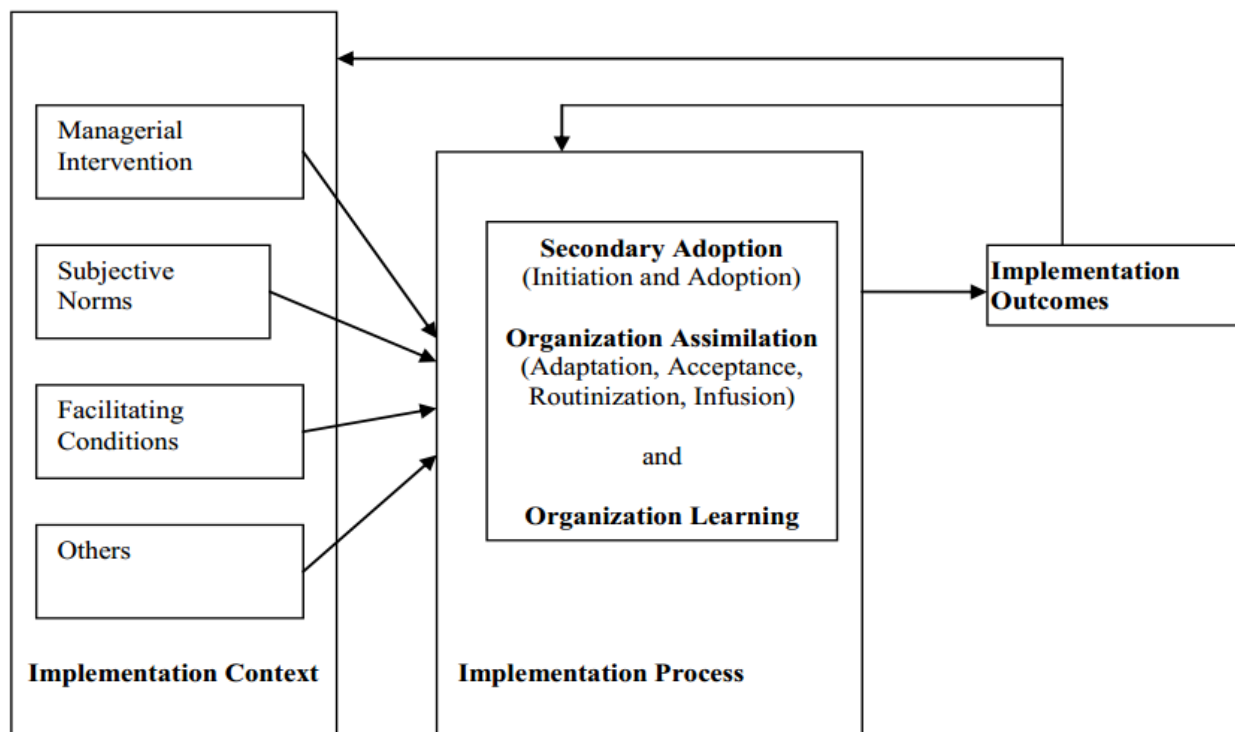
Figure 2.3: Implementation Context, Process and Outcomes by Wausi (2009)

The study by Wausi and Waema used an enhanced Gallivan's framework by incorporating organizational learning, change management interventions and feedback loop to the implementation context.

2.5.3 The Design-Reality Gap (Heek, 2003)

The design-reality gap framework helps measure any difference that exists between a project's initial design expectations and current implementation realities. The gaps between design and reality are assessed along eight dimensions as shown in the figure below.
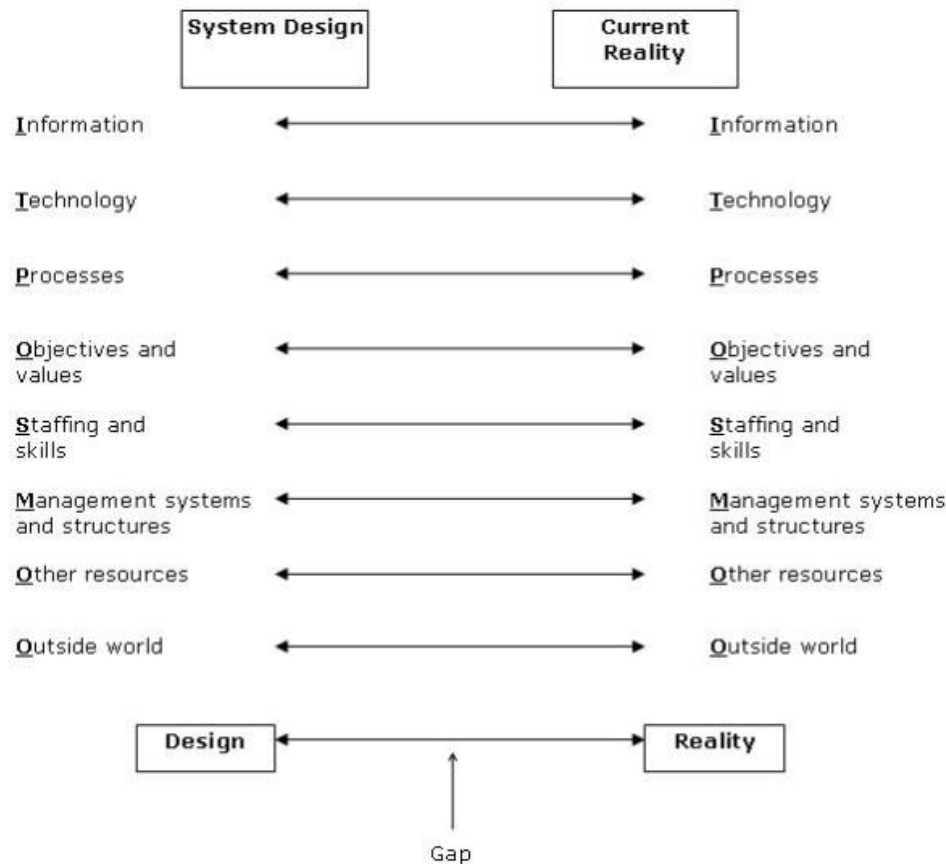
Figure 2.4: The Heek's Design-Reality Gap framework

2.5.4 TOE Framework

The technological, organizational and environmental context greatly influences the process by which organizations take on and roll out technological innovations (DePietro, Wiarda, & Fleischer, 1990). The technological context incorporates all the technologies in the organization. The technologies could be both equipment and processes. The organizational context implies the attributes and resources of the organization, including the organizations size, level of formalization, leadership structure, organizations human resources, and relationships among employees. The environmental context comprises of the industry, the organization's competitors

and the industry regulatory authorities (DePietro, Wiarda, & Fleischer, 1990). Therefore the three aspects affect the way an organization perceives, searches for and implements new technology.
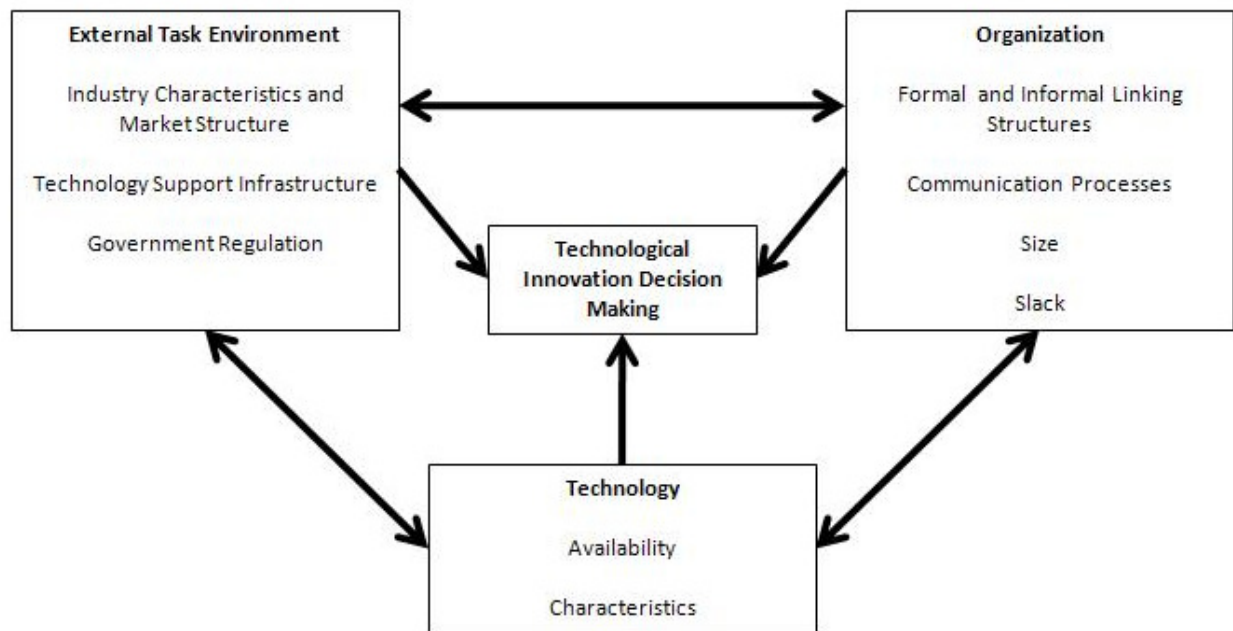
Figure 2.5: TOE framework (DePietro, Wiarda, & Fleischer, 1990)

The TOE framework is regularly used to study the adoption of technology (Gibbs and Kraemer, 2004; Zhu et al., 2006). TOE framework is also used in investigating the factors of implementation, technology use and assimilation (Zhu et al., 2006). The TOE framework therefore provides an ideal framework to investigate the factors which determine the ERP post implementation success.

Zhu et al. (2009) develop an integrative model to examine ERP post-implementation success based on the TOE theory.
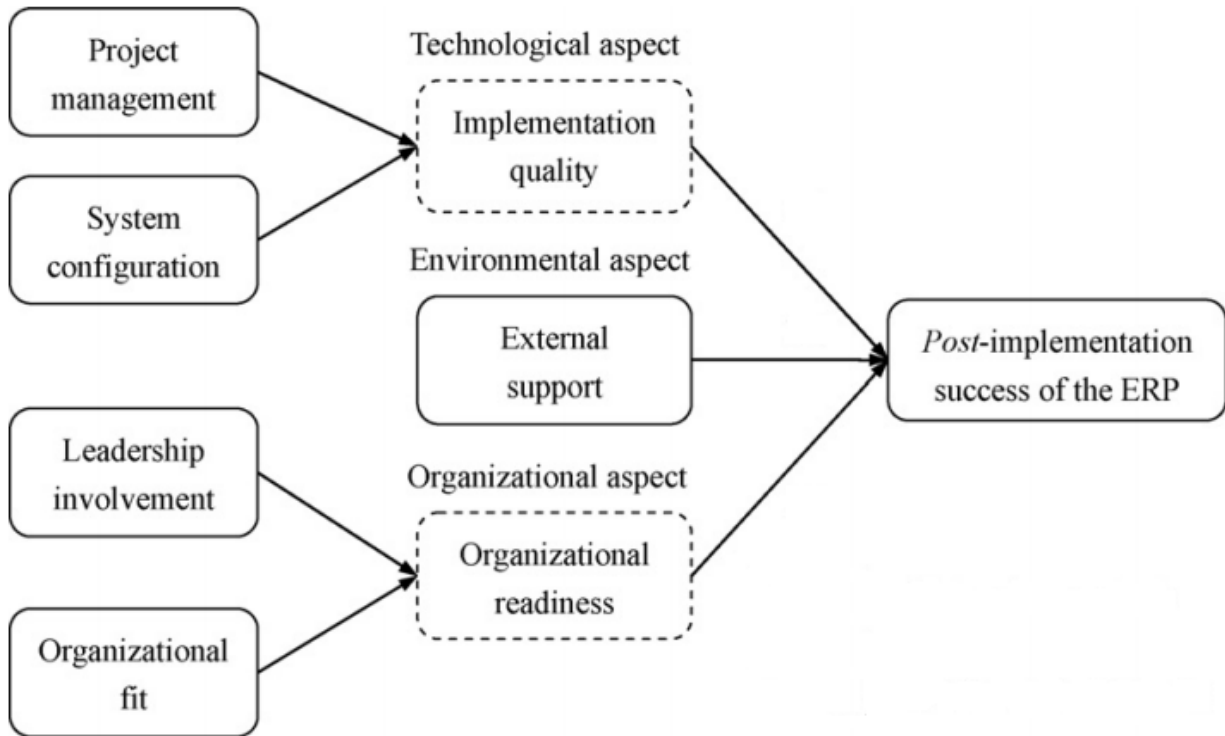
Figure 2.5: The Zhu et al. (2009) Research Model for ERP post implementation success

They hypothesize that ERP post implementation quality has the environmental aspect which focuses on external support. It also has project management and system configuration which are termed as technological aspects. The organizational aspect on the other hand consists of organizational fit and level of leadership involvement. The aspects positively affect the success of the ERP system post-implementation phase.

They conducted an empirical test in the Chinese retail industry whose results displayed that both organizational readiness and the quality of ERP implementation affect the success of the ERP post implementation, however external support does not.

The research however acknowledges that external support when in other settings may influence the success of ERP system post implementation phase.

2.6 Conceptual Framework

At post-implementation stage, the assimilation of the ERP system is the process by which the ERP system entangles into the day-to-day activities, that is, the management and operational philosophy of the ERP is slowly fused with business processes and decision making (Mabert, Soni, & Venkataramanan, 2003)

ERP system comprises different modules and programs. ERP implementation covers most of the departments in the organization. Upon go-live, the ERP system becomes the infrastructure for business operations and enables integrations among business processes. The ERP system changes an organization's hierarchy by influencing the organizations operations. This shows the likelihood that post implementation success of the ERP system is influenced by several factors around the organization. The TOE theory thus affords the study a suitable theoretical foundation to investigate factors that affect ERP post implementation success in corporates.

The research model for this study is adopted from the Zhu et al. (2009) Research Model for post implementation success of ERP. The model was adopted as it was used to conduct a similar study of ERP post implementation success in the Chinese retail industry as what our study intended among the Kenyan corporates.
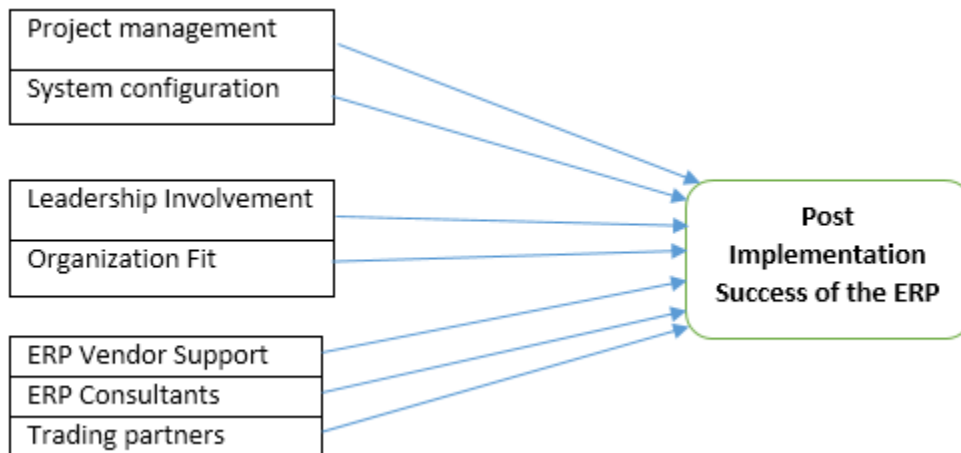
Figure 2.6: Conceptual Model

2.6.1 Technological aspect

ERP implementation quality is defined as the configuration and implementation of ERP systems in order to fulfil an organizations business requirements. Systems that support operational flexibility and managerial flexibility are termed as high quality systems (Nicolaou, 2004). Managerial and operational benefits can be derived from using this systems (Karimi et al., 2007). Perceived ease of use and usefulness in ERP systems displays high quality implementation of the ERP system which will positively affect users' attitudes toward the system and which in turn enables users to effectively use the ERP system (Kim, Chun, & Song, 2009).

2.6.1.1 Project Management

Re-implementation can occur when there is a poorly managed ERP project (Nah et al., 2003; Umble et al., 2003). This will lead to additional investment and delays in achievement of ERP benefits (Hsu, Sylvestre, & Sayed, 2006). Re-implementation leads to reduced morale of the users which will eventually lead to resistance towards the ERP system and in turn leads to less usage of the system (Zhu et al., 2010).

The implementation process may and system capabilities may not be known to the senior management who are dependent on the IT department to implement and handle project management of the ERP system. The IT department is tasked with the responsibility of debugging and maintenance. Once the project is completed, IT will play a major role in adjusting the system to fit the evolving needs of the business (Stratman and Roth, 2002; Kumar et al., 2003).

User participation is encouraged from early implementation stages of the ERP to help in recognizing the needs and problems associated with system use. Resistance and rejection may be encountered if users' needs are not met (Markus et al., 2000). Valuing the contributions of the users makes them more confident that the system will meet their needs and hence will accept the system (Kawalek and Wood-Harper, 2002).

2.6.1.2 ERP System Configuration

Wu and Wang (2006) identified eleven ERP system elements that are key in evaluating user satisfaction.

These are: system stability, system information accuracy, relevancy, timeliness, auditing and control, completeness, ease of use, output requirements and usefulness of the system for the user.

Another key characteristic is flexibility which is an important requirement for organizations (Gupta and Kohli, 2006). ERP system that are flexible enough are able to support various business lines and strategies in different industries (Gupta and Kohli, 2006). ERP should enable add-on of other modules that will help support additional functions and business processes. The connection of the ERP system to other systems should complement analysis and data processing (Ahituv et al., 2002).

2.6.2 Organizational aspect

Organizational readiness refers to the actions taken by an organization for effective and successful ERP deployment. The readiness can be seen to be favourable by ensuring that the environment for the ERP usage matches with the organization and the ERP system by having sufficient operational resources. The benefits of the ERP deployment will be felt when there is good preparation. Synergy between the organization and the ERP will be achieved when there is adequate leadership and high organization fit (Amrani, Rowe, & Geffroy-Maronnat, 2006).

2.6.2.1 Leadership Involvement

It can be defined as the level of support either directly or indirectly that is accorded by top management in the use of ERP in an organization. Research has shown that the success of ERP projects can be attributed leadership and management support (Somers and Nelson, 2004). Management support is important as it ensures flawless change management and commitment mobilization of all stakeholders (Somers and Nelson, 2004).

Continuous monitoring of the ERP project by top management leads to successful implementation (Somers and Nelson, 2004; Zhang et al., 2005). Constant monitoring by senior management will ensure commitment in system usage. The commitment should be seen in the post implementation stage to ensure successful running of the ERP system. Management should continue to provide adequate resources for maintenance and upgrades.

Management can use reward strategies to enable acquisition of new skills and learning among users (Jerez-Gomez et al., 2005). Voluntary training and development by individuals in the organization can be encouraged by having positive reward systems and recognition systems that will encourage individuals to pursue training (Jerez-Gomez et al., 2005). Reward systems and compensations can also lead to change in user attitudes leading to effective use of the system (Jerez-Gomez et al., 2005).

2.6.2.2 Organization Fit

ERP "best practices" have been gathered from multiple industries, which may not be compatible for the adopting organizations' current practices (Morton & Hu, 2008). The practices of an organization and those of the adopted ERP system ought to be consistent otherwise, the implemented ERP will not harmonize the business processes and will not integrate various business units (Somers & Nelson, 2003). Organizational fit does require that there is a match between the actual users and the ERP systems required ideal operators. Most post-implementation failures of ERP can be traced to end users who are unqualified in the use of ERP. They tend to come up with their own operational processes rather than following the ERP procedures (Umble et al., 2003), thereby causing many human-made errors (Gupta, 2000). However, by proper education and training on the ERP requirements, users can perform business operations on the ERP system in a more proficient manner, leading to managerial and operational benefits (Somers & Nelson, 2003).

2.6.3 Environmental aspect

The post implementation success of an ERP has external factors to the organization that also influence it (Markus & Tanis, 2000). An organization will find a leap in its operations and management that will overstretch its capabilities when it steps into the post implementation stage of the ERP implementation. This deficiency can be solved by seeking external support from other parties such as ERP consultants, ERP vendors, and trading partners (Gable, 2003).

2.6.3.1 ERP Vendor Support

ERP vendor support is vital to ERP systems and there needs to be a strategic relationship between user organizations and vendors (Chang, 2004; Somers and Nelson, 2004).The vendor has a critical role in offering timely and continuous support throughout the ERP life-cycle, including the post-implementation stage (Chang, 2004). In the early implementation stages, the vendor supports the

organization with rapid implementation tools and technologies that enable business process modelling, industry specific business practices templates and server hardware and ERP software guidelines (Somers and Nelson, 2004). These tools and technologies are important for knowledge transfer and better understanding of business processes and will therefore reduce the time and costs of deploying the ERP within the organization (Somers and Nelson, 2004). ERP systems require regular upgrades to improve on functionalities and also need continuous investment for module upgrades so as to achieve strategic business value (Somers and Nelson, 2004). The vendor's support is of technical fixes, software patches, routine maintenance and other services, and can thus be judged to be very important for the ERP system's success (Chang, 2004; Somers and Nelson, 2004).

2.6.3.2 ERP Consultants

The choice of ERP consultants should be carefully thought out by the organization even at the post-implementation stage. Consultants will mainly have comprehensive knowledge in specific industries and comprehensive skills in certain modules and would provide a clear direction for the organization (Somers and Nelson, 2003). ERP consultants can also come in to offer knowledge transfer on the effective use of the ERP system at the post implementation stage (Gable, 2003). Good consultants are reservoirs of good ERP knowledge acquired through experience gain over many implementations, which are important for the ERP system both at the operational and managerial levels (Gable, 2003).

2.6.3.3 Trading partners

The organizations trading partners also influence the deployment of the ERP system at the post-implementation stage by cooperating with the organization in provision of requirement such as accurate and compatible business data (Xu, Nord, Brown, & Nord, 2002). When the ERP system of both the organization and its trading partners can link, there are synergy benefits that are produced during the business interation (Kelle and Akbulut, 2005).This synergy can be seen in different forms like information sharing, collaborative predication, and shared inventory management.

2.6.4 Post Implementation Success of ERP

Organizations invest in ERP systems to be able to achieve the promised benefits that come with the ERP system once it is rolled out and assimilated into the organization. The benefits are both tangible and intangible while other benefits are quantifiable and unquantifiable. Shang and Seddon (2002) classified ERP benefits into: organizational, operational, technological, strategic and managerial.

Benefits offered by ERP PIS include: Operational benefits which influence day to day activities like improvement of customer service, organizational productivity improvement and reduction in cycle time. At a leadership level; there is improved planning and resource management and better decision making in different business units (Shang and Seddon, 2002; Mabert et al., 2003). A shared vison for the organization is created as user's communication improves and there is better understanding of business processes. These organizational advantages provide ERP adopting firms' advantages in valuable strategies and close links with customers and other partners (Shang and Seddon, 2002).

Table 2.1: Constructs descriptions

Constructs	Description	Indicator
Project Management	Ensuring that the ERP system is implemented according to the planned scheme and that the system is able to smoothly connect every aspect of an organization	Documentations such as requirements analysis, user acceptance testing Programmers and roll-out units for each module Competent super users and team members Knowledgeable support team Refresher Trainings for users and support team
System Configuration	ERP architecture which involves the functional scope and the manner in which all the system components are organized and integrated	System is easy to use by end-users System is perceived to be useful System is flexible to accommodate customizations and changes System exhibits reliability System produces accurate results always

Leadership Involvement	The role of top leaders in ensuring the successful deployment of the ERP system at the post-implementation stage	Leadership provides financial support for the system Continuous follow-up of system development and utilization Understanding and use of the system by leadership
Organizational Fit	The match between the requirements of an ERP system and an organization's operations	Job roles Change Business processes change Reporting structures change Continuous changes to the system
ERP Vendor Support	ERP Vendor providing continuous post-implementation assistance to the client organization	Vendor provides upgrades for the system or modules of the system Vendor delivers patches to fix issues identified in the system Vendor provides Issue/Trouble resolutions Vendor avails Learning materials and system user guides
ERP Consultants	Important reservoirs of codified and uncodified ERP knowledge accumulated through a series of prior implementation experience who can provide professional advice	Knowledge transfer to users and management User Training on system usage and best practices Integration of new modules in the system Consulting services on critical system customizations and reporting
Trading Partners	This are external actors such as suppliers and partners who interface with the organization's ERP system	Industry necessitated Data sharing Interfacing with external sources like suppliers or agents Conforming to industry/government regulations
Post Implementation Success of ERP	Ability of the system to meet expected deliverables post go-live as per the organization's requirements	Employees gain more and better information for doing their jobs thereby minimizing errors and improving communication Minimal unplanned outages of the system Acceptable system performance Timely support and resolution of issues raised by users

CHAPTER 3: RESEARCH METHODOLOGY

3.0 Overview

This chapter outlines the research methodology that was used. This includes the research design, target population, sampling technique, data collection methods and data analysis and presentation methods.

The case study approach required a selection of a corporate locally. The corporate therefore had to meet the following criteria: Have deployed and are using an ERP system, be on post implementation phase of ERP system that they use, ERP system in use in as many departments as possible within the organization.

3.1 Research Design

The research study used a mixed mode approach to cover the multiple objectives to this study. Quantitative and qualitative research methods complement each other to come up with a mixed mode research approach. The qualitative research method provided for in-depth explanations, user experiences, personal opinions and knowledge whereas quantitative research brought on board statistical data.

3.2 Target Population

The target group of this study comprised of all staff in the local corporate who directly interacted with the ERP systems and had been in the organization prior to the ERP system go-live. These employees included Senior Managers, Supervisors and Non-Management staff in the various departments in the organization namely; Information Systems, Finance, HR, Ground Services & Cargo, Flight Operations, Commercial & Marketing and Technical.

3.3 Sample Size

The study used purposive sampling to interview the ERP project managers, ERP super users for the various departments and modules, ERP support team, ERP consultants, selected users of the ERP system from various departments and the management staff.

IS, Finance and HR department had more respondents due to having most of the ERP project and implementation team members. These departments were also identified as the departments that are the major users of the ERP system.

Table 3.1: Sample size

Area	Target Population	Sample
Information Systems	80	20
Finance	100	20
HR	15	10
Ground Services & Cargo	150	5
Flight Operations	100	5
Commercial & Marketing	50	5
Technical	60	5

Source: Research

3.4 Data Collection

The study used a variety of sources to gather information. Using different sources enabled triangulation, where similar information was gathered from different sources and comparisons were made. The study used interviews, focus groups, questionnaires and project documentation documents.

Interviews and focus groups were a major source of data for this case study. This is because the main aim of this study was to gain and bring out the respondents' point of view. Usually personal in-depth interviewing method is preferable over techniques such as a survey or workshop meeting (Batenburg & Walbeek, 2009).

Interviews were conducted among selected key management staff, ERP super users and IT team. Questionnaires were administered allowing both open-ended and close-ended questions. To enrich the study, project documents like ERP support contracts, ERP road map and strategy plans, ERP systems integrations, ERP architectural design among others were used.

The study ensured that an interview guide with a set protocol was used and shared with the respondents before and after the interviews and this helped to track the items that were discussed in the interviews. The retrieved data was then transcribed and verified by the respondents.

3.5 Data Analysis

This study is both quantitative and qualitative, and therefore used various data analysis methods. The returned questionnaires were validated, coded and tabulated for analysis. Quantitative data collected was analysed using statistical software (SPSS) and the results of these measures was presented in tables and charts.

For qualitative data from interviews, focus groups and documents, notes were first transcribed and trends in the data noted. The transcripts provided key phrases, reflective remarks and notes that helped us form a general picture of what was being discussed. Sentences and words of the transcripts were then categorized in order to facilitate insight and comparison.

A comparative analysis of the qualitative and quantitative results was carried out to identify relationships between the various constructs.

CHAPTER 4: RESULTS AND DISCUSSION

4.0 Introduction

This chapter presents a summary of the results and findings of the data collected in the study.

4.1 Response Rate

Table 4.1 presents a summary of the findings with respect to the response rate sent to different sections of the business that are using ERP system in their day to day activity.

Table 4.1: Response Rate

Department	Response Expected	Response Received	Response Rate (%)
Information Systems	15	15	100
Finance	10	10	100
HR	5	5	100
Ground Services & Cargo	5	4	80
Flight Operations	5	5	100
Commercial & Marketing	5	3	60
Technical	5	3	60
Total Response	50	45	
Average Response Rate			90

The total number of online questionnaire obtained from the respondents was 45 representing a response rate of 90%. Information Systems, Finance, HR and Flight Operations departments had the highest response rate at 100%, followed by Ground Service department at 90%, and followed by Commercial & Marketing and Technical each at a response rate of 60%.

Other respondents who participated in the research were 7 respondents for interview and 10 for focused group discussion against a target total of 20. This gives a response rate of 85%.

4.2 Responses on Project Management

4.2.1 Respondents whose suggestions and feedback were consideration by the ERP Project Team

Table 4.2 presents the results of the findings with regards to the respondents feeling on the uptake of their feedback and recommendations by the ERP Project Team

Table 4.2 Uptake of suggestion and feedback by ERP Project Team

		Frequency	Percent	Valid Percent
Valid	missing	2	4.4	4.4
	yes	35	77.8	77.8
	no	8	17.8	17.8
	Total	45	100.0	100.0
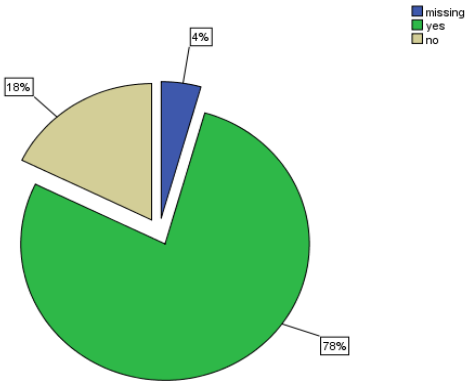
Figure 4.1: Uptake of suggestions and feedback by the ERP Team

Figure 4.1 above further illustrates how respondents' suggestions and feedback are taken by the ERP Project Team. Of all the responses obtained, 78% of the respondents believe that their suggestions and feedback are always considered by the ERP Project Team, while only 18% believe that they are left out, and 4% of the respondents did not respond to that question. The results depicts the commitment to the ERP project team to the requirements gathering and CSIP that can only be successful when we factor in customer feedbacks and recommendations through continuous engagement.

4.2.2 Respondents with ERP Champions/Super Users in their Department

Figure 4.2 below illustrates the composition of respondents with ERP Champions in their sections and those without. From the finding, it indicates that 86.67% of the respondents have an ERP Champion, and only 8.89% of the respondents do not have. The respondents who were not sure of the existence of ERP champion and those who did not respond were each 2.22%. The findings indicate the ERP project team's commitment to empower staff by complete separation of technical and functional issues. The functional issues are handled by the ERP champions at the department level, and also empowerment of departmental colleagues through periodic refresher training, new staff inductions, and maintenance of knowledge base on step by step user manual on how to execute functional issues. All this is geared towards attaining optimal performance from the ERP system.
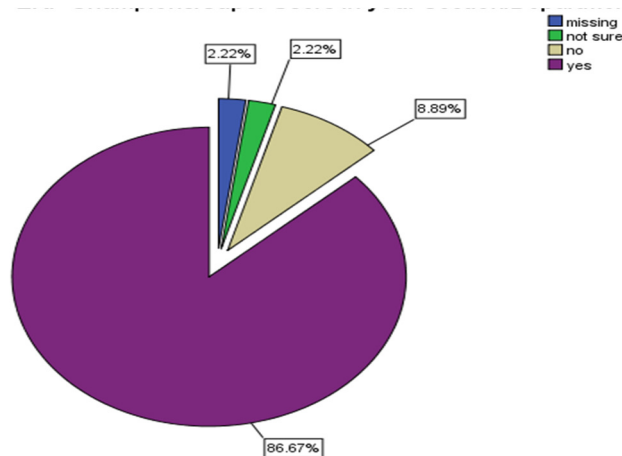
Figure 4.2: Respondents with ERP Champions/Super Users

4.3 Responses on System Configuration

4.3.1 Respondents response to the ERP system configuration

Table 4.3 below 24% of the respondents indicated that ERP reporting has greatly enabled them make sound business decision, and inclusion of it the strategy will go a long way in steering the organization a head of the rest. 23.4% have both indicated that ERP has enabled them perform common tasks and obtain critical information easily. 15.6 % have indicated that through ERP they have been able to be acquainted with latest business trends and critical information on the business environment, and 13.6% of the respondents indicated that their duties have been put under good control by the ERP workflows.

Table 4.3 ERP System Capabilities

		Responses	
		N	Percent
statements below about the ERP system	Let's you perform common tasks	39	23.4%
	Allows you to have a high level of control over your duties	23	13.8%
	Allows you to obtain critical information easily	39	23.4%
	Allows you to identify trends and get critical information about your business environment	26	15.6%
	Provides reports that are used to make decisions	40	24.0%
Total		167	100.0%

4.4 Responses on Leadership Involvement

The researcher sought to know the degree to which senior management supported the ERP system. Respondents were given a scale of disagree, neutral and agree.

Table 4.4: Level of agreement concerning senior management support for ERP system

Statement	Percentage (%)		
	Disagree	Neutral	Agree
Senior management keeps contact with the ERP team	8.9	40	51.2
Senior management provides sufficient resources for ERP upgrades, maintenance and support	4.4	33.3	62.2
Senior management considering ERP as part of their strategic vision	4.4	31.1	64.4
Senior management considers ERP system as a priority to them	11.1	31.1	57.8
Senior management encourages users to learn skills from external sources	8.9	44.4	46.7

Source: Research

The researcher also sought to find out in what ways the users thought senior management would better support the ERP system.
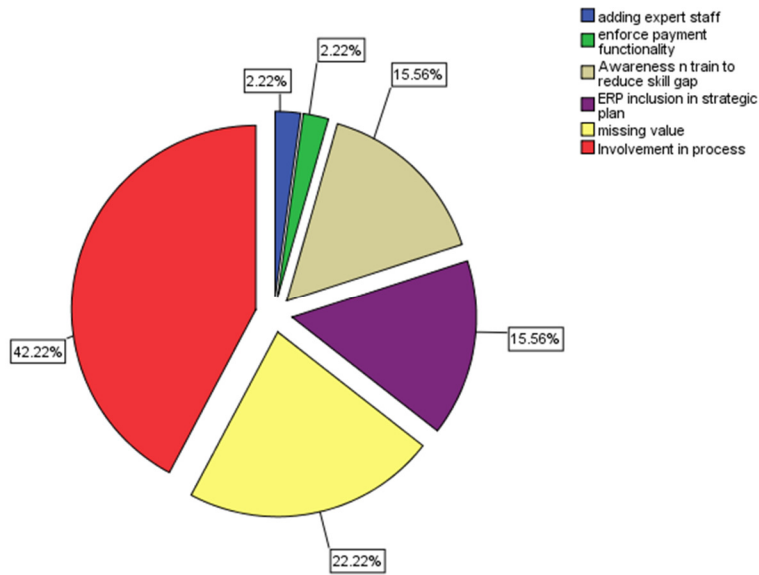
Figure 4.3: What management can leverage on to achieve ERP Success

The findings in table 4.4 and figure 4.3 shows that 42.2% of the respondents indicated that they need management to be fully involved in the processes of ERP to ensure post implementation success, they need managers to lead from the front. 15.6% of the respondents wants the ERP systems process to be included in the organization overall strategic plan, a similar number 15.6% indicated that more awareness through training needs to be done to bridge the knowledge gaps, 2.22% of the respondents each indicated the need to add more expert staff and enforcement of policy to ensure all financial processes are done through the ERP system. 22.2% of the respondents did not give their view on this research question.

4.5 Responses on Organization Fit

The researcher sought to find out if there had been restructuring or change in job roles as a result of the ERP system in the various departments. Most of the respondents indicated that there had been job and role changes in their departments as a result of the ERP system deployment.
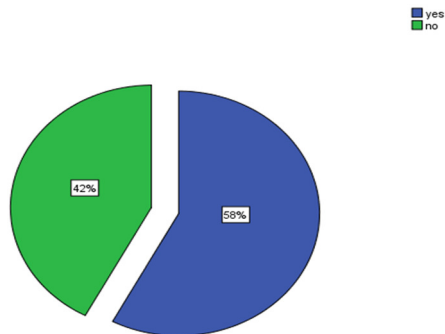
Figure 4.4: Restructuring and changes in job roles after ERP implementation

The researcher also sought to find out if the employees were regularly monitored to ensure they had the skills to use the ERP system. From the responses, majority indicated that there was regular monitoring of the employees to ensure that they had adequate skills to use the ERP system.
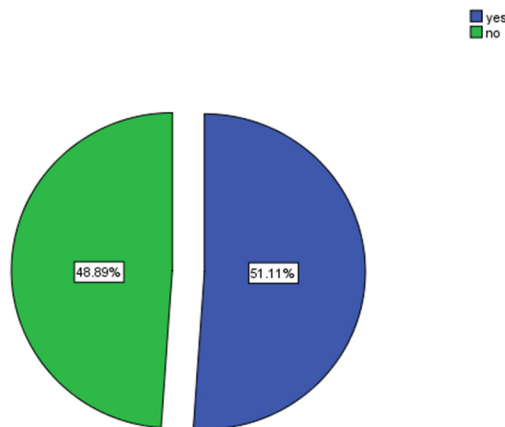
Figure 4.5: Employees monitored to ensure they have ERP skills

4.6 Responses on ERP Vendor Support

The researcher sought to find out if there was vendor support and if there had been any system upgrades or changes to the ERP system. Most of the respondents indicated that they had experienced vendor support in form of upgrades and system patches availed by the ERP vendor.
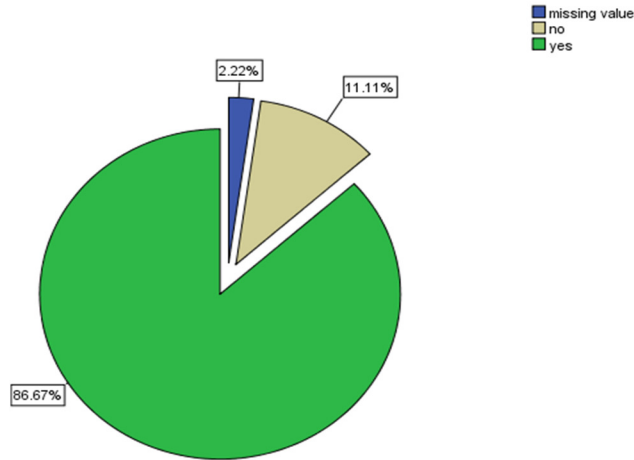
Figure 4.6: ERP vendor support

4.7 Responses on ERP Consultants

The researcher sought to know if the organization engaged ERP consultants. Majority of the respondents confirmed that the organization engaged ERP consultants.
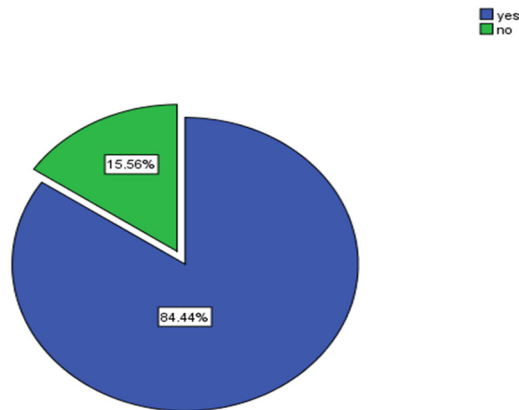
Figure 4.7: ERP Consultant Engagement

The researcher further sought to find out if the ERP consultants were important for improved ERP system usage. Most of the respondents indicated that the ERP consultants were important for improved ERP system usage.

Table 4.5: Level of agreement with statement concerning ERP Consultants

Statement	Percentage (%)		
	Disagree	Neutral	Agree
Consultants are important for improved ERP system usage	11.1	15.6	73.3

4.8 Responses on Trading Partners

The researcher sought to find out if there were pressures from the industry for integrations and continuous improvement of the ERP system. Findings indicated that majority of the respondents confirmed that there was pressure from the industry for integrations and continuous improvement of the ERP system.
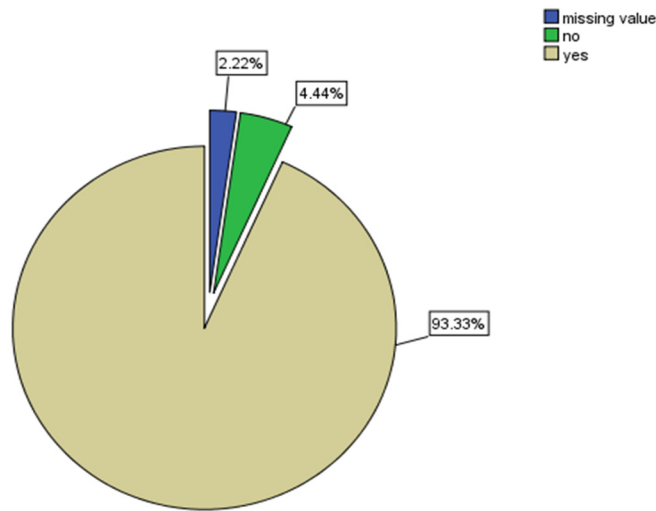
Figure 4.8: Pressure from industry on improvement of ERP system

4.9 Responses on ERP post implementation success.

4.9.1 Factors that affect the post implementation success of ERP systems from all stakeholders in the organization

The table 4.6 below indicates the findings on factors that make ERP systems not perform optimally, though a big number of the respondents did not respond to this question, the 68.9%, who did not respond this question had agreed that the ERP system was performing to their optimal level. Of the 31.1%, who said that ERP performance was not optimal, 6.7% each indicating that underutilization of functions, use of other reporting tools and downtimes incidences had derailed the optimal performance achievement in ERP, and the remaining 2.2% each indicated that skill gap, user irresponsibility, and the lack of awareness have greatly contributed in ERP systems not achieving their optimal usage. The figure 4.3 below further illustrates the factors for low ERP performance.

Table 4.6: Factors for ERP underperformance

Factors for LOW ERP Performance		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	missing value	31	68.9	68.9	68.9
	lack of awareness	1	2.2	2.2	71.1
	user irresponsibility	1	2.2	2.2	73.3
	skill gap	1	2.2	2.2	75.6
	underutilization of the functions	3	6.7	6.7	82.2
	Other reporting tools still used	3	6.7	6.7	88.9
	downtime incidences	3	6.7	6.7	95.6
	functional errors	2	4.4	4.4	100.0
	Total	45	100.0	100.0	

However, when the respondents were further asked to give their opinion on what they feel could be done by all the stakeholders for the realization of optimal ERP post implementation success as indicated in table 4.5 below, 34.9% of the respondents indicated that the role played by the champions and the super use is very vital as it helps mitigate unnecessary delays because the functional issue can be handled by the champions so that IS technical personnel are left with time to handle complex processes like system integration with legacy applications. 15.9% indicated better vendor support that ensures better system health, on-time system upgrades and integration has enable them achieve optimal performance.14.3% of the respondents indicated that the good support from management and IS team they are getting will greatly improve the ERP performance, and the same percentage of respondents cited that better training that they have gone through has equipped them with the right skill to deliver ERP maximized performance. The respondents who indicated better functionality upgrade were 7.9%, and those who indicated the role of system integration and CISPs as being vital.

Table 4.7: Factors helping success of post ERP implementation

Factors Helping Successful usage of ERP System				
		Responses		Percent of Cases
		N	Percent	
Factors that successful usage of ERP[a]	The super users play a good role in the system	22	34.9%	61.1%
	Enough trainings	9	14.3%	25.0%
	Functionality enhancements	5	7.9%	13.9%
	CSIPs	4	6.3%	11.1%
	Good vendor support	10	15.9%	27.8%
	Good support from management and IS	9	14.3%	25.0%
	Easy to use functionalities	4	6.3%	11.1%
Total		63	100.0%	175.0%

On factors promoting the success of ERP System, the respondents indicated as shown in the table 4.7 above. 34.9% of the respondents indicated that ERP super users played a good role in the success of the ERP system, 14.3% of the respondent said that trainings aided better use of the system, 7.9% of respondents felt that functional enhancements contributed to ERP post implementation success. Those who indicated high CSIP's were 6.3%, good vendor support was indicated by 15.9% and support from IS and management was 14.3%. 6.3% of the respondents indicated ease of use of the functionalities contributed towards ERP post implementation success.

Table 4.8: Factors hindering success of ERP System

Factors Hindering the Success of ERP System				
		Responses		Percent of Cases
		N	Percent	
Factors Hindering the success of ERP[a]	Knowledge gap/Inadequate trainings	1	4.0%	5.6%
	System downtimes	4	16.0%	22.2%
	Resistance to change	10	40.0%	55.6%
	Lack of vendor support	3	12.0%	16.7%
	System bugs	3	12.0%	16.7%
	Lack of upgrades/integration	1	4.0%	5.6%
	High staff turnover	2	8.0%	11.1%
	Underutilization of ERP modules	1	4.0%	5.6%
Total		25	100.0%	138.9%
a. Dichotomy group tabulated at value 1.				

This result indicates that the organization has to do more on change management in order for post implementation success of ERP to be realized. They need to sensitize the staff through on job training, accountability and ownership. They need to enlighten them of the immense benefits they stand to gain by embracing the application of ERP in their day to day work so that they can attest to how it will make their work easier.

The vendor support needs to be enhanced as well as the internal capabilities created in equal measure to ensure proper knowledge management for faster resolution of system downtimes, upgrades, integration and fixing of bugs. When internal capabilities is enhance and the technical staff in IT is equipped with fast paced troubleshooting, patching, bug resolution, root-cause analysis, and system optimization skills. System issues on bugs, integration with legacy systems, and downtimes will be resolved promptly without going through the vendor who might sometimes take time depending on the contractual SLA terms.

4.10 Relationship between factors in the organisation's contextual environment and ERP post implementation success.

In order to investigate the relationship between factors in the organization context environment in respect to ERP post implementation success being a catalyst to the level of ERP performance optimization. Series of Chi-Square and R-Square analysis are done to better understand the relationship between the different variables.

4.10.1 Chi-Square Analysis

Chi-Square analysis of the variables are analysed, null hypothesis is formulated, tested for either approval or disapproval.

Table 4.9 Project management

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.408[a]	4	.823
Likelihood Ratio	1.492	4	.848
Linear-by-Linear Association	.004	1	.949
N of Valid Cases	45		
a. 7 cells (70.0%) have expected count less than 5. The minimum expected count is 1.24.			

The chi-square test to checks the relationships on how the effectiveness of the ERP project management affects the ERP post implementation success

H_0: *ERP project management is not positively associated with the post implementation success of ERP*

H_1: *ERP project management is positively associated with the post implementation success of ERP*

From the analysis, the p-value=0.823 is less than α=0.848, implies that we have a reason to reject the null hypothesis and conclude that there is a relationship between project management and ERP post implementation success.

Table 4.10 System configuration

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.344[a]	4	.154
Likelihood Ratio	6.128	4	.290
Linear-by-Linear Association	.345	1	.557
N of Valid Cases	45		
a. 6 cells (60.0%) have expected count less than 5. The minimum expected count is .31.			

The chi-square test to checks the relationships on how the ERP system's configuration affects the ERP post implementation success

H_0: *ERP system configuration is not positively associated with the post implementation success of ERP*

H_1: *ERP system configuration is positively associated with the post implementation success of ERP*

From the analysis, the p-value=0.154 is less than α=0.290 implies that we have a reason to reject the null hypothesis and conclude that there is a relationship between the ERP system's configuration and ERP post implementation success

Table 4.11 Leadership involvement

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.242[a]	5	.715
Likelihood Ratio	2.846	5	.824
Linear-by-Linear Association	.803	1	.370
N of Valid Cases	45		
a. 9 cells (75.0%) have expected count less than 5. The minimum expected count is .31.			

The chi-square test to check the relationships on how the leadership involvement affects ERP post implementation success

H₀: *Leadership involvement is not positively associated with the post implementation success of ERP*

H₁: *Leadership involvement is positively associated with the post implementation success of ERP*

From the analysis, the p-value=0.715 is less than α=0.824 implies that we have a reason to reject the null hypothesis and conclude that there is a relationship between the leadership involvement and ERP post implementation success

Table 4.12 Organizational fit

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.132[a]	1	.032
Likelihood Ratio	4.229	1	.045
Linear-by-Linear Association	4.040	1	.044
N of Valid Cases	45		
a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.84.			

The chi-square test to check the relationships on how organizational fit affects ERP post implementation success

H₀: *Organizational fit is not positively associated with the post implementation success of ERP*

H₁: *Organizational fit is positively associated with the post implementation success of ERP*

35

From the analysis, the p-value=0.032 is less than α=0.045 implies that we have a reason to reject the null hypothesis and conclude that there is a relationship between the organizational fit and ERP post implementation success

Table 4.13 ERP Vendor support

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.829ª	2	.564
Likelihood Ratio	1.147	2	.661
Linear-by-Linear Association	.048	1	.826
N of Valid Cases	45		
a. 4 cells (66.7%) have expected count less than 5. The minimum expected count is .31.			

The chi-square test to check the relationships on how ERP Vendor support affects ERP post implementation success

      H$_0$: *ERP Vendor support has no positive effect on the post implementation success of ERP*

      H$_1$: *ERP Vendor support has positive effect on the post implementation success of ERP*

From the analysis, the p-value=0.564 is less than α=0.661 implies that we have a reason to reject the null hypothesis and conclude that there is a relationship between ERP Vendor support and ERP post implementation success

Table 4.14 ERP Consultants

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.705ª	4	.608
Likelihood Ratio	2.556	4	.635
Linear-by-Linear Association	1.640	1	.200
N of Valid Cases	45		
a. 7 cells (70.0%) have expected count less than 5. The minimum expected count is .62			

The chi-square test to check the relationships on how ERP Consultants affects ERP post implementation success

      H$_0$: *ERP consultants have no positive effect on the post implementation success of ERP*

H₁: *ERP consultants have positive effect on the post implementation success of ERP*

From the analysis, the p-value=0.608 is less than α=0.635 implies that we have a reason to reject the null hypothesis and conclude that there is a relationship between ERP Consultants and ERP post implementation success.

Table 4.15 Trading partners

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.785ᵃ	2	.675
Likelihood Ratio	1.054	2	.590
Linear-by-Linear Association	.727	1	.394
N of Valid Cases	45		
a. 4 cells (66.7%) have expected count less than 5. The minimum expected count is .31.			

The chi-square test to check the relationships on how trading partners affects ERP post implementation success

H₀: *Trading Partners have no positive effect on the post implementation success of ERP*

H₁: *Trading Partners have positive effect on the post implementation success of ERP*

From the analysis, the p-value=0.675 is less than α=0.590 implies that we have a reason to accept the null hypothesis and conclude that there is no relationship between trading partners and ERP post implementation success.

4.10.2 R-Square Analysis.

This involves testing relationship between the levels of ERP post implementation success (Dependent variable) against Independent variables as shown in figure 4.5 below.
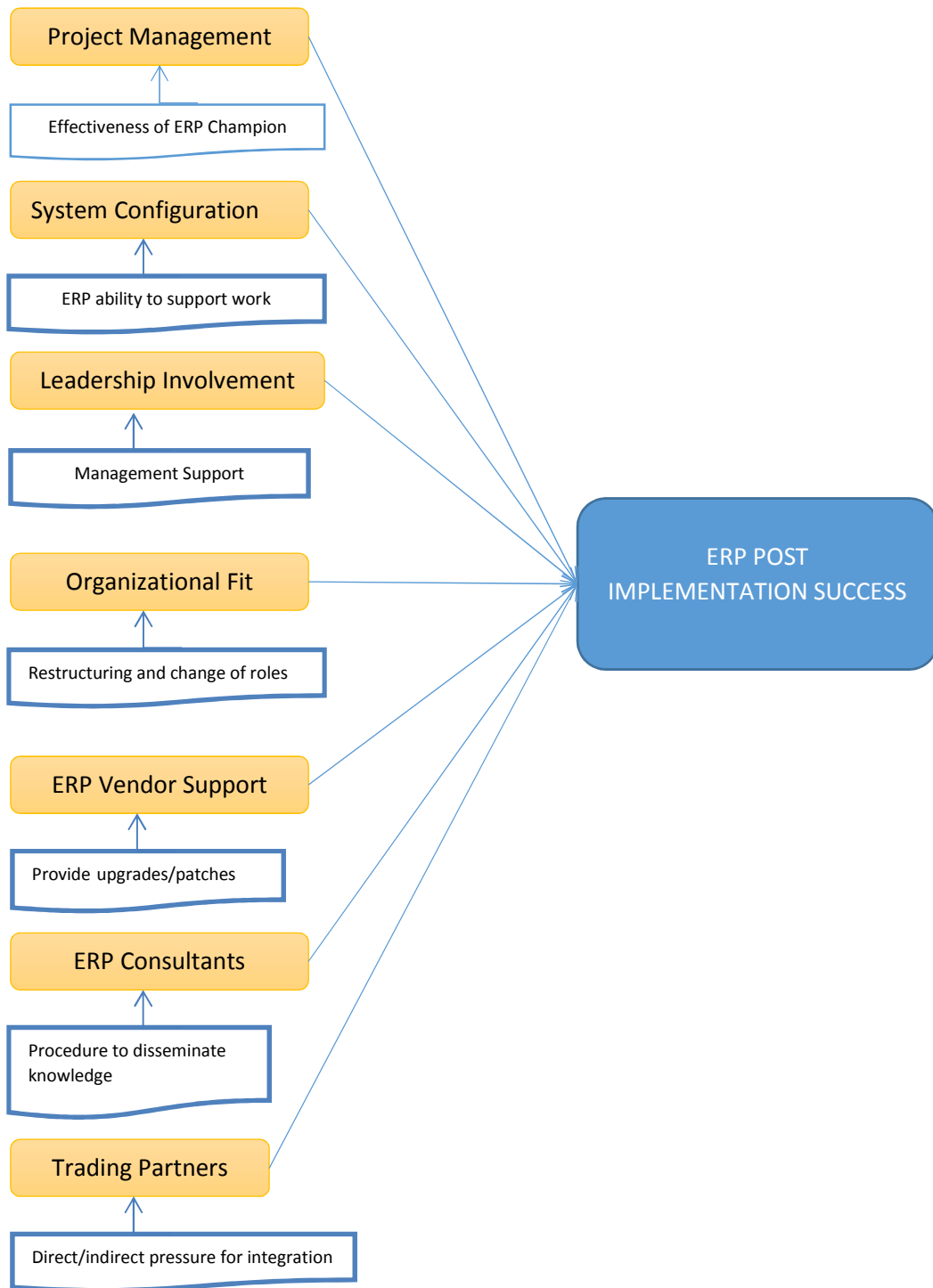
Figure 4.10: Relationship between the variables

To test this relationship we run R-Square Analysis (Regression Analysis)

Table 4.12: R-Square Analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.369[a]	.136	-.027	.475
a. Predictors: (Constant), Project management, System configuration, Leadership involvement, Organization fit, ERP vendor support, ERP consultants, Trading partners				

The R square suggests that the independent variables explain 13.6% of the variability in the dependent variable.

Table 4.13: ANOVA Analysis

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.312	7	.187	.832	.0467[a]
	Residual	8.332	37	.225		
	Total	9.644	44			
a. Predictors: (Constant), Project management, System configuration, Leadership involvement, Organization fit, ERP vendor support, ERP consultants, Trading partners						
b. Dependent Variable: ERP post implementation success						

From the ANOVA table, F ratio =0.832, and p<0.05, we conclude that the regression equation fits the data well.

Table 4.14: Coefficient Analysis

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.804	.680		1.183	.244
	Project Management	.330	.062	.123	.698	.489
	System Configuration	.340	.082	.029	.166	.869
	Leadership Involvement	.280	.044	.109	.642	.525
	Organizational Fit	.143	.155	.262	1.563	.127
	ERP vendor support	.164	.237	.126	.694	.492
	ERP Consultants	-.032	.071	-.078	-.448	.657
	Trading Partners	-.264	.354	-.147	-.747	.460
a. Dependent Variable: ERP post implementation success						

From the analysis, we find that 1% change in project management attribute leads to a 33% increase in ERP post implementation success, a 1% increase in extent of system configuration leads to a 34% increase ERP post implementation success, a 1% increase in leadership involvement leads to 28% increase in the ERP post implementation success, a 1% increase in organizational fit leads to 24.3% increase in the ERP post implementation success, 1% increase in ERP Vendor support leads to 16.4% increase in the ERP post implementation success, 1% increase in ERP consultants leads to 3.2% decrease in the ERP Optimal performance and 1% increase in the level of trading partners leads to 26.4% decrease in the ERP post implementation success.

The negative influence of ERP consultants on ERP post implementation success could be explained from the long duration taken by the consultants to respond and resolve systems issues that could easily be resolve if the internal staff were empowered and also breaking of already existing functionalities by the changes introduced into the system by the consultants. Negative influence from trading partners could be explained from the customizations and compliance changes they bring about that were not designed and planned for initially and therefore cause design gaps.

Project management, system configuration, leadership involvement, organizational fit, ERP vendor support, ERP consultants and trading partners are statistically significant since they have $p < 0.05$ from the ANOVA table.

4.11 Results from Interviews and Focus Group Discussion

On the aspect of ERP project management, majority of the interviewed respondents agreed that the team overseeing the ERP implementation was more than effective and had the outlook of the whole company as it drew it membership from all the sections in the organization. Respondents also confirmed that the project management process was up to international standard, as it followed best practices. The project process which involved requirement gathering and documentation, was iterative in nature hence following the Scrum agile project methodology process where end users feedback is very vital at every stage of the project cycle. They also indicated that creation of ERP champions and super users made the projects roll out successful, because they assisted greatly in solving functional problems at departmental level. However, they said that there were issues that that did not go right. They cited issues like project duration taking so long beyond the allocated time and cost, the pre-implementation training was not adequate, and also failures in functionality

of some of the ERP modules at the stage of go-live. It was generally agreed that there was need to continuously engage the users and act on their feedback and also ensure there is always competent super users even as the organization experiences staff turnover.

The system configuration brought forth a versatile ERP system architecture according to the respondents. They cited examples like consultants working arm in arm with the vendor to provide the right ERP architecture. They further indicated that mandatory system stress test and validation were carried out prior to go-live, and that the customization on the modules was done by the implementation team with an eye-view guideline from the consultants and the respective business representatives. The customization process according to the respondents involved making user interface as simple as possible, building the interfaces and testing the data flow, and incorporation of monitoring tool for constant system health checks. The respondents further indicated that error and information messages assisted them get used to the system being that there was frequent output quality issues during the early stages of post implementation stage. However, the respondents cited the need for a system upgrade because the current ERP version was old and the hardware too had reached the end of life, a case that puts the company in a precarious state and they also stressed on the need for more system optimization.

On the aspect of leadership involvement, the respondents indicated that the management initially followed ERP implementation process with vigour and great zeal, but that seriousness died with the process, hence pleaded for them to rejuvenate their zeal and commitment. They further stated that leadership has also made financial commitment which involved incorporation of more ERP modules that were not present on implementation at the go-live state, they cited examples like the Uniform Management module, iSupplier module and iRecruitment. They also indicated that senior management were still present in the ERP steering committees, but they want not only their presence to be felt, but also their actions in the areas like skill gaps created by high staff turnover, and implementation of the audit findings from the ERP system.

On organizational fit, the respondents indicated that there had been restructuring in various departments so as to better align with the ERP system in cases where most of the processes were changed like in HR after the introduction of iLearning, Overtime and Employee Self Service modules. It was also noted that there had been numerous changes to the system in terms of customizations to enable the ERP system serve the organization better as per their preferred way

of doing things. New job roles were introduced as a result of the ERP system assimilation. Respondents also cited challenges like staff culture of working off the system, trust issues on matters like delegation when going on leave. There was also the aspect of resistance either to certain processes or introduction of certain modules.

The vendor support has been very immense as indicated by the respondents. The findings indicated that the organization received patch sets from the vendors to help in bug resolution, vendors have provided solutions to ERP problems and they have adhered to the contractual SLA. In spite of all these, the respondents indicated the support from the vendor has proved to be too costly and time consuming given that the organization is running on an old version of the ERP, and has to constantly pay for extended support charges. They hence recommend a complete overhaul or replacement of the system.

ERP consultants have only been involved when need arises as indicated by the respondents. The finding shows that consultants have only come in when the need for system customization arises or activation of new modules. They have also offered valuable advice to the organization on system best practices and related aspects and better training that enable good understanding of the ERP system. But, the respondents indicate that some functions the consultants build do have a ripple effect of creating bugs in other functions. They cited a case when multicurrency function was introduced; the users were not able to execute month-end closure for some time until the bug was resolved. Respondents also cited the need to empower in-house teams so as to reduce on the dependence on consultants.

On the aspect of trading partners, the respondents indicated that they too have influenced the implementation of the ERP system. They cited case where some suppliers demands that the XML invoicing standard be used in ERP and also the government institutions insisting that some of its regulations like taxation and custom duty aspects must be enforced in the system like the introduction of P9 form generation for employees from the ERP system.

The ERP Post Implementation Success was cited to be a continuous improvement process. They stated that system utilization was increasingly advancing. The respondents also applauded the integration of ERP and other legacy system that has led to improved data quality and reporting in the organization and better financial decision made using ERP. However, they cited factors that impede the ERP post implementation success like system downtimes, highly trained staff turnover

leads to a widening skills gap, hence the need for continuous training for better succession planning, heavy dependence on IT staff even on functional issues that ought to be resolve by ERP champions and super users, so that IT team are left to handle technical and integration issues. Generally, respondents were in agreement that success of ERP system in the post implementation phase would be realized if the impeding and cited issues were tackled.

4.12 ERP post implementation success in the organization

The organization under study has challenges in the ERP post implementation phase which are summarised below:

a) Staff turnover resulting in skills gaps where ERP super users and ERP system developers have left without replacement.

b) Occasional Hardware failures due to aged servers that have reached 'end-of-life' and constrained server resources due to lack of server resource upgrades and lack of timely server maintenance

c) Running on out-of-supported version of ERP application and database resulting to poor vendor support

d) Many customizations resulting in introduction of bugs to the system

e) Many functional issues being handled by IS team due to lack of training/knowledge among the business users

f) Lack of strict adherence to use of the system where some things are done out of the system and also use of parallel systems.

4.13 Chapter Summary

The results agreed with the initial problem statement that there existed challenges in the success of ERP post implementation stage. Respondents confirmed that there was need for continuous improvement on the organizations contextual environment (Project Management, System Configuration, Leadership Involvement, Organization Fit, ERP Vendor, ERP Consultants and Trading Partners) at the ERP post implementation stage so as to achieve ERP post implementation success.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.0 Research Assessment

The purpose of the research study was to investigate the issues that influence ERP systems post implementation success, provide insights in leverage points that management should consider so as to achieve ERP post implementation success and to investigate the relationship between factors in the organization's contextual environment and ERP post implementation success by assessing ERP systems post implementation success in Kenyan Corporates.

The research was an adoption of the framework by Zhu et al. (2009) integrative model based on TOE theory. The study involved literature review; interviewing subject matter experts through questionnaires, project documents and responses from focus groups. Data collected was analyzed and thereafter conclusion and recommendations were drawn.

The research used quantitative and qualitative methods of research. Using different sources enabled triangulation, where similar information was gathered from different sources and comparisons were made. The study used interviews, focus groups, questionnaires and project documentation documents.

The structure of the report starts with introduction where the objectives are set and the background, justification of the study provided. The researcher then explored the theoretical background of the study where different frameworks were studied. The research methodology was then presented where the data collection instruments were described as well as data analysis. The results were presented, discussed and conclusion and recommendations drawn. This reports format is therefore consistent with the standards expected for academic writing.

The finding of this research would benefit top management and ERP implementers to better manage the ERP post implementation phase and to achieve maximum value for the benefits generated from the ERP system. Findings from the study would also be of interest to the academic fraternity and other researchers by helping them to understand ERP systems post implementation issues hence adding to the body of knowledge.

5.1 Evaluation of Research Objectives

Objective 1: Identify the factors that affect the post-implementation success of ERP systems

From the research findings, several factors were identified in terms of the factors affecting ERP systems post implementation success. These were identified as:

i) Unplanned downtime incidences due to system unavailability or hardware related issues.
ii) ERP skills gaps both at functional and technical levels mainly attributed to staff turnover and inadequate trainings.
iii) Functional errors as a result of user irresponsibility and lack of awareness of system processes.
iv) Usage of parallel systems like reporting tools leading to underutilization of ERP system functions
v) Lack of upgrades resulting in many system bugs and lack of vendor support.
vi) Resistance to change from business users due to change in processes that go against their work culture and also appear to threaten their job roles.
vii) Too many customizations being managed by ERP consultants tend to break some system functionalities and introduce bugs to the system.

Several factors were also identified as promoting factors for ERP post implementation success. There are:

i) ERP champions and super users who are very knowledgeable in specific modules provide guidance and issue resolution at the functional and business level.
ii) ERP trainings both in-house and external bridge the skills gaps and also provide confidence to users and also the support team.
iii) Management support financially and also by enforcing ERP usage policy and closure of audit gaps.
iv) System and hardware upgrades so as to minimize downtimes and ensure good vendor support.
v) Ensuring ease of use of system functionalities and customizations.
vi) Entrenching CSIP's by performing post implementation reviews often so as to address emerging challenges in good time.

Objective 2: Investigate what management should put in place in order to achieve post implementation success of ERP Systems

This study brings out various issues that affect and promote ERP post implementation success that management can leverage on to ensure success at the ERP post implementation phase. The insights are summarised as:

a) Cross-functional interaction among the technical and functional areas is a continuing necessity in ERP post implementation phase so as to enhance user support and better manage customizations and enhancement requests.

b) Educating or on boarding technical and skilled functional staff with the development and analytical skills necessary to work with the ERP system is of great importance in order to maximize the benefits of the ERP system.

c) Budgetary issues are a driving force in enabling the maximization of the ERP system benefits at the ERP post implementation stage. It affects staffing and resources allocation for different ERP system needs.

Objective 3: Investigate the relationship between factors in the organisation's contextual environment and post implementation success of ERP Systems

In achieving this objective, the research validated the various hypotheses that were formulated. Below is a summary of the hypotheses validation:

Table 5.1: Summary of Hypotheses validation

Hypothesis Code	Hypothesis statement	Result
Hypothesis 1	*ERP project management is positively associated with the post implementation success of ERP*	From the analysis, the p-value=0.823 is less than α=0.848, implies that we have a reason to reject the null hypothesis and conclude that there is a relationship between project management and ERP post implementation success. **This hypothesis is supported**
Hypothesis 2	*ERP system configuration is positively associated with the post implementation success of ERP*	From the analysis, the p-value=0.154 is less than α=0.290 implies that we have a reason to reject the null hypothesis and conclude that there is a relationship between the ERP system's configuration and ERP post implementation success. **This hypothesis is supported**

Hypothesis 3	*Leadership involvement is positively associated with the post implementation success of ERP*	From the analysis, the p-value=0.715 is less than α=0.824 implies that we have a reason to reject the null hypothesis and conclude that there is a relationship between the leadership involvement and ERP post implementation success. **This hypothesis is supported**
Hypothesis 4	*Organizational fit is positively associated with the post implementation success of ERP*	From the analysis, the p-value=0.032 is less than α=0.045 implies that we have a reason to reject the null hypothesis and conclude that there is a relationship between the organizational fit and ERP post implementation success. **This hypothesis is supported**
Hypothesis 5	*ERP Vendor support has positive effect on the post implementation success of ERP*	From the analysis, the p-value=0.564 is less than α=0.661 implies that we have a reason to reject the null hypothesis and conclude that there is a relationship between ERP Vendor support and ERP post implementation success. **This hypothesis is supported**
Hypothesis 6	*ERP consultants have positive effect on the post implementation success of ERP*	From the analysis, the p-value=0.608 is less than α=0.635 implies that we have a reason to reject the null hypothesis and conclude that there is a relationship between ERP Consultants and ERP post implementation success. **This hypothesis is supported**
Hypothesis 7	*Trading Partners have positive effect on the post implementation success of ERP*	From the analysis, the p-value=0.675 is less than α=0.590 implies that we have a reason to accept the null hypothesis and conclude that there is no relationship between trading partners and ERP post implementation success. **This hypothesis is not supported**

5.2 Conclusion

ERP Post-implementation success greatly influences the overall success of the ERP system. Empirical data obtained during this study shows that Technological, Organizational and Environmental factors do lead to great organizational benefits. This research study provides an extension to the current research on ERP from the inception stage to the post-implementation stage in Kenya corporates and the research findings by this study will help corporates and ERP implementers better manage the ERP post implementation stages and harness the value generated by the ERP system.

We drew the following conclusion from the research study findings:

i) On Technology, this study brings out the importance of effective project management and sound system configuration.

ii) With respect to Organization, leadership involvement and organizational fit are needed for organizational readiness to be achieved.

iii) With respect to Environment, external parties to the organizations like ERP vendors and ERP consultants were found to contribute to the post implementation success of the ERP. However, the study got empirical results that displayed that trading partners were not necessary for ERP success at the post implementation stage in the local corporate.

5.3 Recommendations

i. Project management

The organization ought to roll out CSIP for ERP in all sections so as to enable all users provide feedback and enhancement requests that will enable the project team capture and act on user suggestions at the post implementation phase.

Management should create job roles for ERP super users so as to motivate the ERP champions and ensure that the role does not die out in the ERP post implementation phase.

ii.   System configuration

IT management should design maintenance and upgrade plans for both ERP hardware and software and ensure that these are budgeted for. The plans should then be assigned as KPI's for respective managers so as to ensure that they are enforced.

iii.   Leadership involvement

Leadership support should remain consistent in order to provide adequate and continuous resources needed by the ERP system at the post implementation stage from all over the organization. There is need to mitigate skills gaps due to staff turnover and to provide leadership on system usage.

iv.   Organizational fit

The organization should ensure that there is consistency between itself and the ERP system so as to reduce on customizations. As a result, for the organization to gain as much advantage from the system as possible, the organization needs to align its processes with those of the ERP "best practices".

v.   ERP vendor support

In order to ensure effective vendor support, the organization needs to put in place measures to ensure that the system is always within the range of "currently supported versions" by the vendor.

vi.   ERP consultants

The organization should reduce dependency on consultants by building internal capacity and working closely with the vendor.

5.4 Limitations and recommendations for further work

Limitations of the case-study approach apply to this study and therefore the selected case may not necessarily represent the whole population of the general Kenyan corporates.

Secondly, our research is hinged on personal perceptions of the respondents and personal bias could not be totally ruled out.

We recommend future research to conduct a survey on corporate institutions in Kenya that use ERP systems and have gone through several upgrades or system changes to find out about their

organizational culture and identify how their experiences differ from those of the organization in this study.

We further recommend a study on Cloud based or outsourced ERP systems as an alternate model for achieving ERP success.

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APPENDICES

Appendix 1: Questionnaire

Dear Respondent,

This questionnaire is intended to gather research data as part of an academic investigation for my Master of Science in Computer Science at the University of Nairobi.

The information obtained will not be used for any other purpose other than to enhance the body of knowledge in Academic Research. I kindly request you to take your time to complete the questionnaire to the best of your knowledge and thereafter send the same back to me. Your participation is highly appreciated.

Thank you.

John Wanjohi

1. **Are your suggestions and feedback on ERP system considered by the ERP Project team?**
   ○ **Yes**   ○ **No**

2. **Do you have ERP Champions/Super Users in your Section/Department?**
   ○ **Yes**   ○ **No**   ○ **Not sure**

If Yes for 2. Above:

How would you rate the effectiveness of the ERP Champion/super user (1=Not effective, 5=Very effective)	1	2	3	4	5

3.

How do you judge the ERP system's ability to support your work? (1=Not useful, 5=Very useful)	1	2	3	4	5

4. **Do you think the ERP system performance is optimal?**
   ○ **Yes**   ○ **No**

   If No for 4. above, please provide a brief explanation why

5. **Tick the box if in agreement on the statements below about the ERP system**

	Let's you perform common tasks
	Allows you to have a high level of control over your duties
	Allows you to obtain critical information easily

		1	2	3	4	5
	Allows you to identify trends and get critical information about your business environment					
	Provides reports that are used to make decisions					

6. Does senior management supports the ERP system on below issues: (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree)

		1	2	3	4	5
i.	Maintain Contact with the ERP team					
ii.	Providing sufficient resources for ERP (upgrades, maintenance, etc.)					
iii.	Consideration of ERP as part of their strategic vision					
iv.	Consideration of ERP as a priority for them					
v.	Encourage users to learn skills from external sources (training, forums, conferences, etc.)					

7. In your opinion how can senior management better support the ERP system?

8. Has there been restructuring or change in job roles as a result of the ERP system in your department?

◯ Yes   ◯ No

9. Are employees regularly monitored to ensure that they have the skills to use the ERP system?

◯ Yes   ◯ No

10. Does the company have instruments (manuals, databases, files, organizational routines, etc.) where information on the ERP system knowledge base is stored?

◯ Yes   ◯ No

11. Has the organization set up procedures to capture, codify and disseminate knowledge of ERP by consultants?

◯ Yes   ◯ No

If Yes in 11. above, are the consultants important for the improved ERP system usage (1=Not important, 5=Very important)	1	2	3	4	5

12. Does the ERP system vendor provide upgrades/patches to sort out known issues in the system?

◯ Yes   ◯ No

13. Is there pressure (direct or indirect) from your industry for the integration and continuous improvement of your ERP system?

◯ Yes   ◯ No

14. According to you what other factors help or hinder the successful usage of the ERP system in your organization?

Appendix 2: Interview/Focus Group Discussion Guide

Authorization will be obtained from each individual prior to their interview. The interviews will be conducted individually or in small groups as appropriate.

Written field notes by the researcher will be the primary means of interview data collection.

I. Introduction

The researcher will introduce himself and thank the participant for his or her time and support of the research project. The researcher will review the nature and purpose of the study with the participant. The participant will also be reminded of the confidentiality of his or her responses.

II. Interview Questions

Interview participants will be asked to respond to the initial questions listed below.

Based upon the respondent's answers, the researcher will supplement the general inquiries with additional probes to draw out the details necessary to identify emerging themes and provide rich data for analysis from which the answers to the research questions of this study will be developed.

1. Describe the organization's ERP System implementation experience from your perspective.

2. Describe the ERP System go-live experience from your perspective.

3. What has been the organization's ERP post-implementation experience from go-live to present from your perspective?

4. How would you describe the current status of the ERP System module?