

# **UNIVERSITY OF ZIMBABWE**



## **GRADUATE SCHOOL OF MANAGEMENT**

**A REVIEW OF ENTERPRISE RESOURCE PLANNING SYSTEM IMPLEMENTATION  
CHALLENGES AT THE WATTLE COMPANY LIMITED FROM 2006 TO 2011.**

**By**

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**Dissertation submitted in partial fulfilment of the requirements for the  
degree of Master of Business Administration, Graduate School of  
Management, University of Zimbabwe**

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## Declaration

I, John Jonga do hereby declare that this work is the result of my own investigation and research, except to the extent indicated in the Acknowledgements, References and by comments included in the body of the report, and that it has not been submitted in part or in full for any other degree to any other university.

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Date .....

**Student's Signature**

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Name: ----- Date-----

**Supervisor's Signature**

## **Dedication**

**To TavongaKudzaisheJonga**

## **ACKNOWLEDGEMENTS**

I would like to acknowledge and thank the following individuals for their contributions to the success of this dissertation; Mr ArnoldChidakwa, my supervisor, for his valuable insightful guidance throughout the research process. Working under his supervision has been a stimulating and rewarding experience. Without his help, this dissertation would have never been a reality. My profound gratitude goes to The Wattle Company management for affording me the opportunity to carry out this study. Special mention goes to all group one discussion members for their intellectual, moral and financial support, Ms N Murefu for typing services for parts of this dissertation.

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To God be the glory!!

## **ABSTRACT**

After spending five years of development and implementation of an Enterprise Resources Planning (ERP) system The Wattle company declared the project a failure. Considerable sums of money and time were spent in trying to successfully implement the project so that the company could have seamlessly integrated information system thereby enabling management to have timely information for decision making.

This study therefore sought to explore how organisations buy ERP systems and investigates major factors that underlie successful ERP project implementation with a view to make strategic recommendations to management. The case study design was adopted as it helps to explore a contemporary phenomenon within its real life context. A mixed method research strategy with a bias towards phenomenological thrust to better understand the meanings respondents attached to the process was adopted in this study.

Study findings show that the process that organisations go through when buying ERP system is more or less the same for other new-task-kind of decision except that in ERP purchasing there is rigorous information search and more collective decision making. Among other host of critical success factors, top management commitment and support, business process re-engineering, need for clear vision and objectives, change management, selection of right ERP package, selecting the right software vendor, effective project management skills, project team leader, consideration to legacy systems and user training emerged highly ranked.

Recommendations from the study entail that management should devote due attention to ERP package evaluation during the purchasing process to minimise customisations, provide adequate timely funding for project operations, reduce project staff turnover for effective knowledge transfer management and manage effectively the identified critical success factors in order to achieve successful ERP project implementation.

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## LIST OF ACRONYMS

ALGOL	Algorithmic Language
APS	Advanced Planning and Scheduling
BPR	Business Process Reengineering
CEO	Chief Executive Officer
COO	Chief Operations Officer
COBOL	Common Business Oriented Language
CRM	Customer relationship management
CSF	Critical success factors
ECSS	Expeditionary Combat Support System
ES	Enterprise System
ERP	Enterprise Resource Planning
FORTTRAN	FormulaTranslation
GBP	Great Britain Pound
GDP	Gross Domestic Product
GNU	Government of National Unity
HR	Human Resources
IBM	International Business Machines Corporation
IT	Information Technology
MIS	Management Information Systems
MNCs	Multi-National Corporations
MRP	Materials Requirements Planning
MRP II	Manufacturing Resources Planning
OBB	Organisational Buying Behaviour
ROI	Return on Investment

SaaS	Software as a Service
SCM	Supply Chain Management
SMEs	Small to Medium Enterprises
TCO	Total Cost of Ownership
UK	United Kingdom
USA	United States of America
USD	United States Dollar
RBZ	Reserve Bank of Zimbabwe
ZSE	Zimbabwe Stock Exchange

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## CHAPTER ONE

### 1.1 INTRODUCTION

This chapter will focus on the background of the study, the problem statement, research objectives and research questions. It will also look at the research proposition of the study which will be tested later in this dissertation. Scope of the study, rationale of the study, research assumptions and the general outline of the whole research are also discussed in this chapter

An Enterprise Resource Planning (ERP) system is an information system that helps organisations to automate how production materials, data, information, and financial resources flow throughout organisational functional areas on a shared single database, distributing universal data, thus enabling production and access to information in real-time (Wickramasinghe & Gunawardena, 2010). Organisations adopt and implement ERP systems pursuing to reduce operating costs, overcome legacy systems limitations, enhancing competitiveness, boosting productivity and improving customer service (Zhang, Lee, Huang, Zhang, & Huang, 2005).

Organisations are moving away from fragmented legacy systems that are difficult to synchronise to integrated enterprisewide systems. Adoption of ERP suites affords companies opportunities to radically re-look at their processes with a view to change them in order to attain anticipated competitive advantages in the market (Al-Mashari & Al-Mudimigh, 2003). The case study company, The Wattle Company, joined the pack of ERP adopters as it sought to integrate its fragmented systems to have information that is timely and complete to improve on the quality of its decision making. However, implementing ERP systems is easier said than done and places remarkable strain on organisational limited resources (Al-Mashari & Al-Mudimigh, 2003).

Existing literature suggests that many ERP implementations have been failures due to their failure to help the organisation attain its objectives(Zhang et al, 2005). Due to the importance of the project, organisations adopting and implementing ERP projects need to understand intimately factors that guarantee success (Loh & Koh, 2004). For that reason, this study sought to identify critical factors that bedevilled ERP implementation at The Wattle Company.

## **1.2 BACKGROUND TO THE STUDY**

This section discusses important issues that will help the researcher to contextualise the study. Therefore the following areas will be focused on; evolution of ERP systems, current market trends, their architecture, reasons for implementing ERP systems and their drawbacks together with a brief background of the case study company.

### **1.2.1 Evolution of ERP systems**

The development and progression of ERP systems strictly followed the turbulent journey of computer software and hardware systems. In the 1960s the bulk of firms designed, developed and adopted centralised computing systems, to a larger extent that automated stocks control systems using relevant inventory packages.

These systems were mainly based on early programming languages that included ALGOL, FORTRAN, and COBOL. The material requirements planning (MRP) systems, developed in the 1970s, came as an improvement to the legacy systems and these involved mostly the materials requirements planning for scheduled production levels. In the same vein, manufacturing resources planning (MRP II) software were introduced in the 1980s which were more inclined to optimising manufacturing processes through synchronising production and the materials requirements. The MRP II systems included such areas as production and distribution team, project management, accounting, engineering and human resources management (Rashid, Hossain, & Jon, 2002). ERP systems were first introduced in the late 1980s into the beginning of the 1990s with the much proclaimed power of integrating inter-functional

enterprise-wide processes. Due to strong already set foundation of MRP and MRP II, enterprise systems were developed in a more advanced manner integrating business processes including human resource management, manufacturing, inventory management, distribution, financial, project management, service and maintenance, and transportation, making information easily accessible in a consistent manner across the enterprise (Rashid, Hossain, & Jon, 2002).

As the years progressed in the 1990s ERP vendors improved their offerings by means of adding more functionalities and modules as “add-ons” to the already existing basic modules that led to the “extended ERPs.” The extended ERP systems comprise such modules as customer relationship management (CRM), advanced planning and scheduling (APS), supply chain management (SCM) and related e-business solutions. Figure 1.1 below shows a graphical depiction of the historical evolution of ERP systems.



Figure 1.1 Adapted from Enterprise Resource Planning—Global Opportunities & Challenges (Hossain et al 2002)

### 1.2.2 Current trends in ERP market

The ERP market has embraced the extended ERP concepts of CRM and SCM. Due to the pressures of cost, high risk and overheads on-premise ERP packages are fast becoming unattractive as there are new offerings on the market termed SaaS/cloud and

best of breed packages. These new breed offers specialised software services and the databases are hosted in the cloud. Companies now have the chance to choose only modules they want to use(Cloud Vision Systems, 2013). This means that solutions can be developed in a shorter timeframe, agile development becomes standard and seamless upgrades become a given. Cloud computing has significantly changed the playing field bringing in business models that are based on usage. ERP pricing model also has changed to the 'per month, per user' pricing model which can be cheaper to SMEs(Wainewright, 2013). Because of flexibility and web based, Cloud will obviously provide much easier access to an ERP system.

The enterprise software market has always been punctuated by intense competition but of late, the best-of-breed and SaaS solution providers have swiftly gained significant market share reaching 18% in 2012(Panorama Consulting Group LLC, 2012). Some of the companies that have done very well include Salesforce.com in CRM and Workday in human capital management. Traditional ERP vendors like Oracle have joined the Cloud frenzy via smart partnerships like the SAP HANA offering launched in 2012(SAP, 2012).

The next section will discuss the architecture of ERP systems.

### 1.2.3 Architecture of ERP systems

ERP systems architecture is such that seamless integration between business functions is achieved and they operate on a centralised database system from which all business functions extract their information from Shehab, et al, (2004)

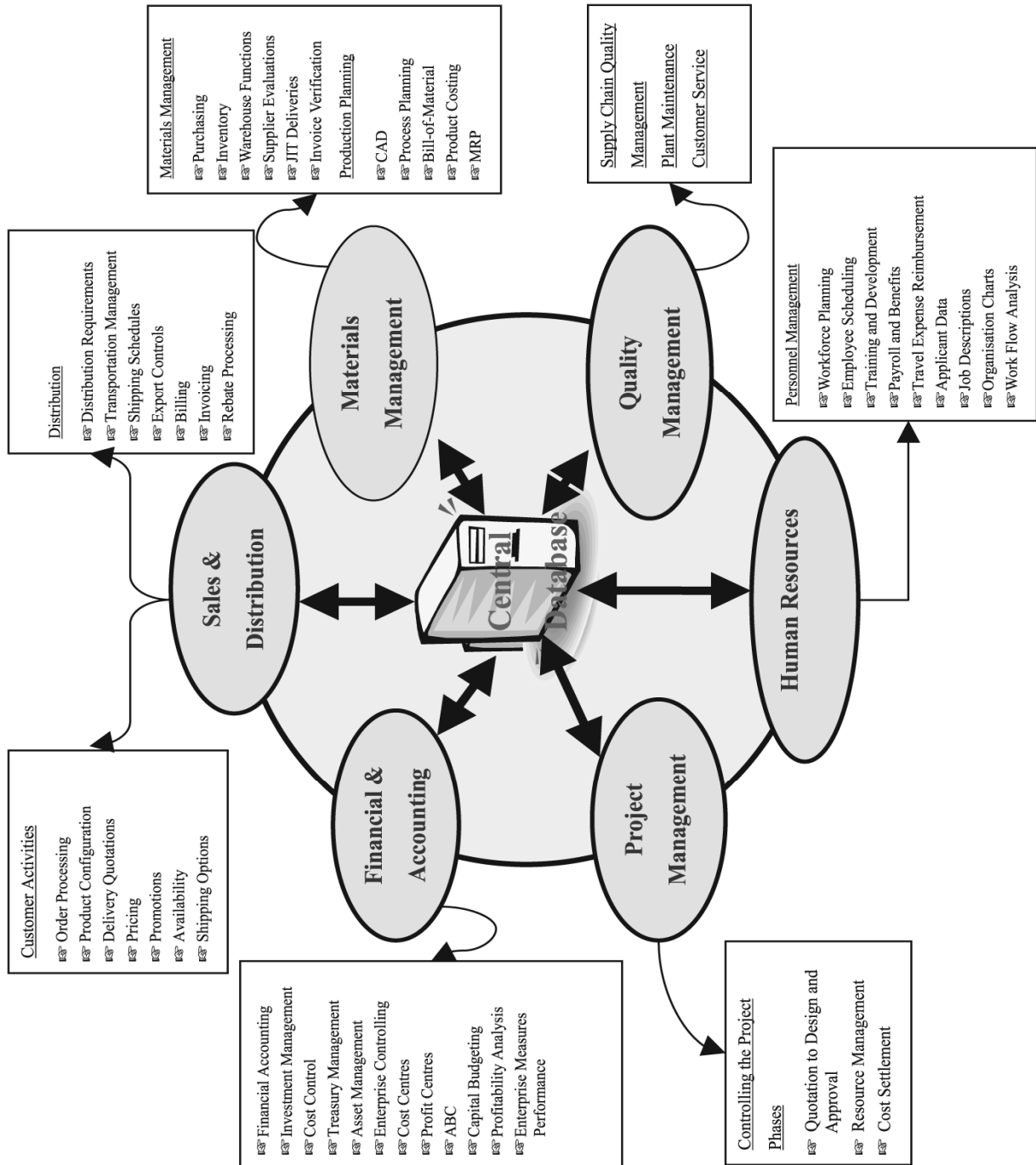


Figure 1.2 ERP Architecture

As Figure 1.2 above depicts, all the facets of the business that is accounting and finance, materials management, sales and distribution, human resources, quality management and production are all interlinked via a central database. The database is relational thus information is entered once and shared to all other areas of the organisation that may require such information. The central database system helps in eliminating data redundancy errors and improves the quality of information in an organisation giving a holistic view of an organisation.

#### **1.2.4 Why implement ERP systems**

Organisations that adopt ERP system usually get trapped by the misconception that by adopting an ERP system, organisations' processes will improve within a short timeframe (Mehrerjedi, 2010). The achievement of potential service improvements and huge cost reductions hinges on the goodness of fit between chosen ERP system and the organisational business processes and on how best configuration and customisation process of the system match strategy, structure and with the business culture, of the adopting organisation (RTS-Systems, 2008). Ideally an organisation expects to improve both back office and front office functions from implementing an ERP system. Reasons for organisations to implement ERP systems range from tangible to intangible potential benefits that are envisaged in the short to long run periods. In justifying investment in ERP systems, organisation compute the return on investment (ROI) weighting it on many intangible and strategic benefits that information systems are expected to harness for the organisation (what-when-how.com, 2010).

According to Davenport et al (2004) as cited in (Dezdar & Ainin, 2011) successfully ERP systems are to produce results such as close-fitting supply-chain links, reduced inventory costs, improved financial management, robust information transactions, condensed transportation and logistics costs, boosted responsiveness to customers, increased productivity, good flexibility lays the foundations for electronic commerce, and make implied knowledge unequivocal. It is however noteworthy that, not all of the above advantages can accrue to the organisation so easily, there is need to follow strict and

proper implementation process to ensure success of the project to realise some of the merits above(Wickramasinghe & Gunawardena, 2010). Because of their complexity ERP systems are not easy to implement(Schoenherr, Hilpert, Soni, Venkataramanan, & Mabert, 2010).

Apart from rendering marvellous services, ERP is not free from its own precincts. ERP calls for a huge and very expensive investment of time and money. Due to huge amounts of cash required for ERP projects, they automatically become management's key result areas given the fact that such an outlay is not a guarantee to the potential benefits but rather subject to proper implementation, training and use(Zhenyu & Prashant, 2001). It is alarming to note the time taken to implement the system in the organisation. This means that large number of workers have to be diverted from their regular labour to undertake lengthy trainings. This does not only disturb the regular functioning of the organisation but also runs the organisation in the high risk of losing current and potential business during the implementation phase(Rashid, Hossain, & Jon, 2002). There is evidence of great advantages that may accrue from the system but on the other hand, when one thinks of this seamlessly integrated information in the hands of undeserving persons who could do more than exploitation, it is evident that there is no way of ensuring secrecy of information and larger probability of risk will be generated as long as information is in the public sphere(Shehab, Sharp, Supramaniam, & Spedding, 2004). In the ever growing epoch of information theft ERP is no exception.

### **1.2.5 Background of Case Study Company**

The Wattle Company Limited, operating primarily in the eastern highlands of Zimbabwe, is in the sustainable management of plantations business. The company was established in 1945 and produces four main products namely wattle extract, eucalyptus poles and saw logs, pine sawn timber and hardwood charcoal. The Wattle Company sells its products on the local and international markets. All its plantations are managed on a sustainable basis thus ensuring the going concern of the company whilst balancing the needs of the business and the environment. The Wattle Company has three Divisions namely Nyanga Pine Timbers, Vumba Timbers and Wattle Mimosa. It also

incorporates Adam Bede and Pine Products, manufacturing companies who focus on hardwood and Pine furniture respectively. Of the 42 837 hectares the company owns, 25 374 are under sustainably managed plantations. The remaining hectares are made up of un-plantable areas such as conservation areas, rivers, mountains, roads, villages etc. (The Wattle Company, 2013).

As a medium sized company, The Wattle Company controls the forests and also the Sawmills which are the means of production. The nature of business is specialised because of the rotation cycles of trees which are at most 25 years. So the information system should ideally keep cost data for the tree rotation cycle and the manufacturing module required for conversion of tree logs into timber is different from the readily available bills of materials kind-of-production in most of the ERP systems hence the system required customisation in order to closely match business processes. The relationship between The Wattle Company and the chosen vendor consultant, nTier Software, lasted for 8 months to January 2008 after which the former decided to hire in-house software developer to continue with the system development process.

The Wattle Company used to operate a number of legacy systems. The sales ordering and invoicing system that is separate from the accounting system, the wages system, a forestry solution system and the accounting system. All of the systems were fragmented and did not talk to each other with manual intervention at each system interface with the other for example the input from wages system is manually captured into the accounting systems via tedious process of journalising the entries. The sales ordering system was Microsoft excel based and was prone to manipulation and errors more easily. Whereas the Forestry solution system is divorced from the accounting valuations done every year for accounting and reporting purposes, the company sought to integrate the two into one solution for the group. ERP systems solve the above fragmentation of information by providing a solution that spans across the whole company (Laundon & Laudon, 2009).

The legacy accounting system that was in place is SMB a dos-based system which thrived on a batch processing mode. This meant that the company could not have essential information as and when it is required but it would have to wait for longer period for batches to be processed and information consequently provided. As the economic difficulties worsened the system could not cope with the number of zeros the currency was having and it could not be upgraded to cater for the accumulation of zeros hence the legacy system became obsolete. The need to have accurate, complete and timely information catapulted the company to search for an alternative information system

In preparation for adopting an ERP system the company undertook a restructuring exercise in 2006. From the start of the project in 2007 the company spent in excess of USD\$350, 000 on infrastructure, system software, consultancy and staff overtime in order to implement the system. The restructuring exercise was part of the Business Process Reengineering meant to prepare the organisation to the future operations based on the new information system. The project cost was substantial and this has seen the company facing cash flow challenges. The first set of audited accounts prepared from Adempiere was as at December 2009. The rollover process was a challenge from year to year with 2011 year end process being the most delaying by almost three months from actual year end. The manufacturing and fixed assets modules are not fully developed to date making it very difficult to manage such critical areas in business.

### **1.3 PROBLEM STATEMENT**

After the five years of implementing and heavy customisation of Adempiere ERP system, The Wattle Company has finally declared the project a failure(Management Report, 2012). Information in the organisation is still fragmented with a stand-alone payroll system, forestry management software and a half-baked ERP accounting system. The company has now resolved to go back on the market to look for another system to choose and implement in-order for it to realise benefits of a functional and

integrated system. The research seeks to explore how organisations buy Enterprise systems and identify those factors that need attention to improve ERP implementation success rates. As the company is planning on looking for another system these factors require utmost management's attention in new system's successful implementation.

#### **1.4 RESEARCH OBJECTIVES**

The objectives of the study are to:

- a) Explore how organisations should select and purchase enterprise systems.
- b) Investigate the major factors that underline successful ERP system implementation
- c) Make strategic recommendations to management

#### **1.5 RESEARCH QUESTIONS**

The study seeks to answer the following questions;

- a) How should organisations select enterprise systems?
- b) What are the major factors that need attention in ERP implementations?
- c) What are the strategic recommendations that can be made to management about ERP adoption and implementation?

#### **1.6 PROPOSITION**

The study maintains that increasing customisations of ERP systems increases the probability of ERP implementation failure.

## **1.7 JUSTIFICATION OF STUDY**

Little is known about researches in ERP implementation failure in Zimbabwe available in published literature. The available literature mainly focuses on critical points that needed to be managed from a successful implementation point of view. This research will add knowledge on traps that Zimbabwean companies need to guard against when implementing ERP Systems from a failed implementation viewpoint to existing body of knowledge.

Most ERP evaluation reviews mainly seek to match software and business objectives meant to be achieved from the implementation of the system. Not much attempt has been done to scrutinise failure so that lessons can be learnt from the failures to avoid future losses. The research could not have been commissioned at any other better time as the organisation is seeking to find another system to implement. Given this background the research findings will be building blocks and act as guidance to the new system search and subsequent implementation to the case company. The results of the research should be able to make management wiser in the next system selection and implementation. The study will help management at The Wattle Company and potential organisations to adopt ERP systems to have a holistic view of ERP systems selection and implementation process.

The study will also help put the Information Technology (IT) departments into perspective and be more proactive as they are usually at the centre of Enterprise Systems (ES) selection and implementation. By alienating major critical factors, the business fraternity will benefit from the research as it will point to issues that require utmost attention in ensuring ERP project success.

## **1.8 SCOPE OF RESEARCH**

The research is a case study based investigation of factors that led to ERP implementation failure at The Wattle Company. The review period will be from 2006 to

2011. This is the period from which the process of searching for an ERP system was initiated to when development efforts were declared fruitless. The Zimbabwean economy was in a meltdown in the period under review to 2008 but since dollarisation of the economy and the formation of Government of National Unity (GNU) in 2009 the economy has been on a recovery path. Macro level factors will not be seriously considered in the factors that influenced implementation as they form part of external environment. Factors that the study will dwell upon are those that were within the influence of The Wattle Company. The assessment was based on the interviews and questionnaires that were administered to project team members (Hong & Kim, 2002).

## **1.9 DISSERTATION STRUCTURE**

The dissertation consists of five chapters with each chapter commencing with an introduction and ending with a conclusion.

**Chapter 1** outlines the problem statement, research objectives and research questions. Significance of the study, research proposition, scope of the study and research assumptions and limitations are also included in the chapter.

**Chapter 2** looks at the review of related literature which embrace views and theories of different authors on the subject.

**Chapter 3** focuses on research methodology and data collection techniques, research philosophies, approaches and data collection methods applied in the study.

**Chapter 4** has the analysis of research findings and their discussion relating them to existing literature.

**Chapter 5** Outlines conclusions from the case study and recommendations and their evaluation.

## **1.10 CHAPTER SUMMARY**

The opening chapter has provided the introductory literature to the research project. Background information on ERP systems, their architecture and the reasons for implementing such systems together with brief history of the case organisation

were provided. A problem statement that the research study aims to answer was conceptualised to show the heart and essence of the study. Research objectives, research questions, research scope, and the significance of study were also brought to the fore. The next chapter will focus on the relevant literature which will explore at length the concepts of ERP adoption, implementations, its success and failure in SMEs in developed and developing world of business.

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

This chapter reviews existing literature on ERP systems with particular focus on theoretical background of ERP adoption and selection, implementation models, key success factors of the selection and implementation process, ERP experiences, ERP adoption in Zimbabwe, and end with the analysis of relevance of the literature to the study. The focus is from the company's perspective rather than the broad national and environmental factors which the company did not have control over. The chapter is arranged into six major sections. The first three sections deal with reviewing literature on definition of ERP systems, ERP system adoption and selection process and ERP implementation methodologies and strategies. The last three sections focus on discussion on identified critical success factors, ERP experiences and ERP adoptions in Zimbabwe.

##### **2.2.1 Definition of ERP Systems**

An ERP system can be defined as integrated business management software that cuts across functional areas such as project management, production, accounting and finance, human resources management, service and maintenance, stocks management, transportation, supply chain management, customer relationship management, and electronic business (Rashid, Hossain, & Jon, 2002). The central notion behind an ERP system is that it includes all technology systems and software in an organisation (Haag & Cummings, 2010). Well-designed Enterprise Systems, given their inculcated best business practice, provide integration of cross-functional processes resulting in the company being able to access instantaneous and latest information. Enterprise systems

are multifaceted and their implementations are a challenging task given the required amount of time and huge expensive costs associated with such projects for an organisation (Davenport, 1998).

The term "ERP", coined in the 1970s, only started to bear its real fruits in the world of business early in the 1990s. Most ERP suppliers claim that ERP system fuses management of major processes of the business on a single database allowing instantaneous access of shared information by various interested business partners. Budding advantages provided by ERP systems include inter alia; significant reduction in stock management costs, serious improvements in working capital management, better understanding of customer requirements, together with the ability to view the whole business value chain in a holistic wholesome manner (Shehab et al, 2004), (Clegg, 2008).

Important features of ERP include; its business processes integration power cutting across the functional divide, its ability to enable different variations of business best practices to be implemented to improve productivity, sharing centralised database and data thus errors are reduced, production and information is accessed in a real-time environment facilitating timely informed decision making (Dey, Clegg, & Bennet, 2009). These errors are eliminated via relational database management system where data redundancy is greatly reduced (Rashid et al, 2002). When it comes to architecture an ERP system utilises a single shared database through which other business software applications interact resulting in high data integrity and accuracy (Shehab, et al, 2004). The use of single client server/database makes information sharing easy, and subsequently decisions made at different levels of the organisation within the parameters of the ERP are automatically broadcast to others in the company who are affected by such decisions (Mehrjerdi, 2010).

ERP systems help to solve information fragmentation problems in enterprises by integrating information flows of an organisation. The standardisation of business processes that is the use of best business practise inculcated in the system, improving

quality and reliability of data, and reducing the expense of running various legacy systems are the major advantages promised by successful adoption and implementation of ERP systems (Dey et al, 2009). Recorded high implementation failure rates of ERP systems is a major concern to prospective organisations considering adopting them even though the system have potential to bring competitive edge to adopting organisations (Kim, Lee, & Gosain, 2005)

Globalisation has transformed the business operating environment making it more uncertain with increasing competition, ever changing customer requirements, and growing markets. These obtaining global conditions are pressurising companies to effectively manage costs across the whole business value chain (Helo, Anussornnitisarn, & Phusavat, 2008). Organisations realised that the problems they continue to face can only be overcome when information is shared across the organisation together with its customers and suppliers (Panorama Consulting Group LLC, 2011). In a bid to survive and outwit competition, companies have now turned to smart partnerships with suppliers and customers bounded by common business goals (Kotelnikov, 2002). In order to achieve their objectives in business, companies are adopting ERP systems. ERP systems have brought about seamless integration in organisation thus doing away with boundaries within the firm and with its customers and suppliers thus enhancing a more open business environment. SMEs have started comprehending how important ERP systems are in their business if they are to survive in today's hypercompetitive markets (Dey, Clegg, & Bennett, 2010).

However, with ERP implementations, even with considerable resources spent, success is not guaranteed. Consequently, it is crucial that the chosen ES, the modules implemented, the modifications and customisations undertaken, and the link to existing legacy systems, if applicable, be carefully considered (Dezdar & Ainin, 2011). The final implemented design of the ERP should then be able to effectively support the company's strategic objectives, reflecting its needs, limitations, and uniqueness (Schoenherr, Hilpert, Soni, Venkataramanan, & Mabert, 2010).

The ERP industry has enjoyed phenomenal growth in the past two decades and is still growing. There are five major ERP players targeting large companies and many smaller players that focus on small and medium sized organisations as their customers. Nevertheless, larger players have also expanded their areas of services into smaller markets expecting to capture significant market share there as well (Panorama Consulting Group LLC, 2011).

### **2.2.2 ERP System adoption selection process**

ERP systems are an integral part of an organisation and their selection takes centre stage. In selecting an ERP suite the strategic objectives of the organisation should be considered. The ERP thus should play an enabling role for organisations to achieve their goals. In designing and implementing an ERP suite organisations need to consider whether the system fits the firm's processes or whether modifications can be done to the processes to fit the system. The choice is an important one given its long-term implications. Likewise, whether to maintain legacy systems whose processes cannot be replicated in the new ERP, as well as their potential interlink with the new package, is a decision that needs to be made. Further to that, the selection of the system vendor, the implementation of a single system needs to be well thought-through. Above decisions should result in a system that is supremely suited for the company, squarely fitting its exclusive organisational objectives and needs. Depending on the firm's situation, the structure of the system can become quite complex; for instance, when legacy systems have to be interlinked with new components. As ES evolve and grow over time, this complexity can increase exponentially. Therefore due to the strategic nature of ERPs, their complexity design and infrastructure their decisions need to be well thought through (Schoenherr, Hilpert, Soni, Venkataramanan, & Mabert, 2010)

Organisations, just like individuals, go through a process called organisational buyer behaviour (OBB) when they want to purchase anything for their use. Using the organisational buying model (OBB) (Palanisamy, Verville, Bernadas, & Taskin,

2010) drew five dominant factors in ES acquisition namely ES strategy and performance, Business Process Re-engineering and adaptability, management support commitment and user buy-in, single vendor integrated solution; and Consultants, team-location, and vendor's financing.

The remaining part of this section discusses these factors individually

### **ES strategy and performance**

Consideration should be given to the strategy for acquiring, the costs involved and performance of the proposed ES under to be purchased. Organisational strategy is considered taking into account the guidelines and agreed framework for ES acquisition, related cost of purchase as these relate to the vision, mission, values and objectives of the organisation.

Organisations vitalise system performance and its ability to suite it business processes and the costs involved in the investment (Buonanno, Faverio, Pigni, Ravarini, Sciuto, & Tagliavini, 2005). This is the front in which most vendors compete for clients. In trying to decide on which ES to purchase, the appraisal team should remain focused on matching ES performance to core functionalities demanded by the organisation. So when ERP vendors are vying for client business they should clearly outline the important points where their software matches the requirements of the business (Simon, Schoeman, & Sohal, 2010). Most of the advantages of acquiring an ES are intangible and therefore difficult to quantify such as resultant customer loyalty, attainment of organisation objectives gaining competitive edge, hence the use of financial appraisal methods may not adequately capture the value of ES systems (Davenport, 1998).

Apart from concentrating on potential benefits that ERP acquisition can bring about, ES strategy should also take into account the total cost of ownership (TCO), an important factor in managing long term cost of the organisation. Total cost of ownership includes the initial project outlay in acquisition and implementation together with the long term system service and maintenance costs (Sieverding, 2008). Ideally organisations should acquire ES systems that are cost effective to run in the long run.

### **BPR and adaptability**

In most cases features of ES systems do not match the business processes squarely hence organisations must decide on whether they can alter the system to match the processes or alter the processes to match the system. Altering processes results in BPR and altering the system results in customisations. BPR which is basically about change management has been identified as a prerequisite to successful ERP implementations whereas customisations should be preferably minimised to enhance implementation success(Buonanno, Faverio, Pigni, Ravarini, Sciuto, & Tagliavini, 2005)

The adoption of ERP systems pressures organisations to conduct BPR so as to re-align their old way of doing business to the new direction the organisation will be taking. ERP systems are powerful tools forrealising the benefits of BPR process.During various ES evaluations the evaluation team should consider that the technical soundness the system provides does not guarantee successful adoption and implementation(Ponis, Tatsiopoulos, Tsitsiriggos, & Christou, 2007). System usability incorporating ease of use, navigation, stability and performance thus meeting user expectations and tastes, and user's feeling of being in control should also be considered(Palanisamy, Verville, Bernadas, & Taskin, 2010).

### **Management commitment and user buy-in**

Top management supportand user buy-in are widely cited positiveinfluencing factors in adopting and implementing of ERP systems(Wang, Lin, Jiang, & Klein, 2007). The ERPliterature identifies the need for top management commitment and support as a critical success factor for implementing ERPprojects(Akkermans & Van Helden, 2002). Management support entails those positive gestures management give to the project including allocation of resources and resolving areas conflict during implementation(Ifinedo & Nahar, 2009). According to Davenport, (1998) top management involvement in the whole process or ERP adoption and implementation has positive ramifications on the success of such projects.

ERP systems influence the way an organisation operates cutting across functional divide thereby affecting almost everyone who uses the system. Interactions between different users are based on the single shared database that feeds information to the whole organisation. Therefore participation of a diversified user team in the adoption and implementation process of ERP system is important in achieving successful implementation (Maguire & Udechukwu, 2010). Users' participation improves the quality of decisions to be made since users have first-hand information about what they want from the system and how the system should work to provide such information.

### **Single vendor integrated solution**

The existing ERP software vendors are not offering an all in one solution for different industries they are serving. Looking for a single ERP that can serve the organisation in all aspects is far-fetched. So for organisations to function well they need to make decision bearing in mind the current legacy systems as to whether information from such systems could be integrated into the new ES system. Sometimes there is need to have more than one systems in order to harness advantages of best specialised systems like human resources and payroll or customer relationship management systems. Integration therefore require that the all the required systems be able to synchronise information (Poniset al, 2007). During vendor appraisal, the organisation assembled ES purchasing team must ask relevant questions concerning the vendors as guided by the requirements list as drawn in the initiation stage and as they relate to the vision values and objectives of the organisation. Information that should be sought include vendor's existing customers, financial stability, reputation, its market shares and competitors among other details (Soja & Paliwoda-Pekosz, 2009).

### **Consultants, team location, and vendor's financing**

Because of lack of required skills organisations are now increasingly using the services of external consultants to improve the management of complex ERP acquisition and implementation decision process (Soja & Paliwoda-Pekosz, 2009). Depending on their wide spread experience in the industry consultants can bring in an independent critical scrutiny required to contribute positively to the acquisition process by reducing the

misfit between the needs of a client-organisation and the available ERP systems. Challenges that occur in implementing ERP systems are usually not because of technology related matters like technological complexity, standardisation, compatibility, but rather they largely emanate from organisational issues such as incompatible business processes, resistance to change, organisational culture clashes, lack of project management skills, lack of top management's commitment (Kim, Lee, & Gosain, 2005).

The use of consultants can be futile especially if the consultant fails to comprehend the client's business and have got limited capacity in terms of resources and skills required to tackle the adoption and implementation process. Therefore, there is need for companies to identify potential post-implementation risks so that vendors and consultants measure themselves against such challenges (Aloini et al, 2007). The consultant's team should be strategically located such that it can support the client's branches or network. Since ES systems demand huge funds outlay to acquire this factor has been acting as a barrier to SMEs breakthrough to the state of art technological advancements. The ERP market has been growing phenomenally and such growth has created competition in the industry forcing vendor to compete on the cost front thus providing vendor financing to ERP adopters (Simon, Schoeman, & Sohal, 2010).

### **2.2.3 ERP Implementations**

After careful selection of ERP package even in cases where business fit is present implementation success is not guaranteed. ERP implementations have attracted various researchers as this stage is critical to realisation of benefits from huge investments in Enterprise systems (Al-Mashari, Al-Mudimigh, & Zairi, 2003). The complexity of ERP systems has forced organisations to reconsider their acquisition and implementation plans (A. Momoh, 2010).

Notwithstanding the paybacks that ERP packages provide in better managing an integrated business, they cost millions of dollars to acquire, huge amount of time to implement, and, more prominently, they drastically change the way organisations operate (Akkermans & Van Helden, 2002). Some organisations see ES systems as IT projects and places the burden of their implementation squarely on IT departments.

Such organisations fail to appreciate that ERP systems adoption has far reaching implications changing the way people and organisations work since ERP systems are a destructive technology invention(Laundon & Laudon, 2009).

Viewing ERP systems as IT projects is a major sticky problem that continue bedevil the implementation of ERP projects. The goal of adopting an ERP system isto improve the business and have competitive advantage over competitors. Hence implementation should be business driven and directed by business requirements andnot the IT department(Mohammed, Kulonda, Jones, & Proctor, 2005). ERPs have high reported failure rates as measured in terms of budget overruns 178% above budgeted levels on average, time spent on implementation being 2.5 times longer and failure to bring about expected benefits managing only 30% of intended benefits being attained. Estimates show that (50-75) % of US organisations experience some degree of failure inERP implementations(Umble, Haft, & Umble, 2003). In the world of ERP, there area lot of shocking accounts of failed implementations and other researchers predict much high figures ranging from (60- 90)% failure rates in ERP projects(Ptak, 2000)

ERP adoption and implementation follow a stage by stage process from initiation, business blueprinting, execution, closing and going live(Dey et al, 2009).**Figure 2.1** gives a graphical presentation of the ERP implementation timeline. There are a lot of activities that take place and are done by different players in the implementationprocess.

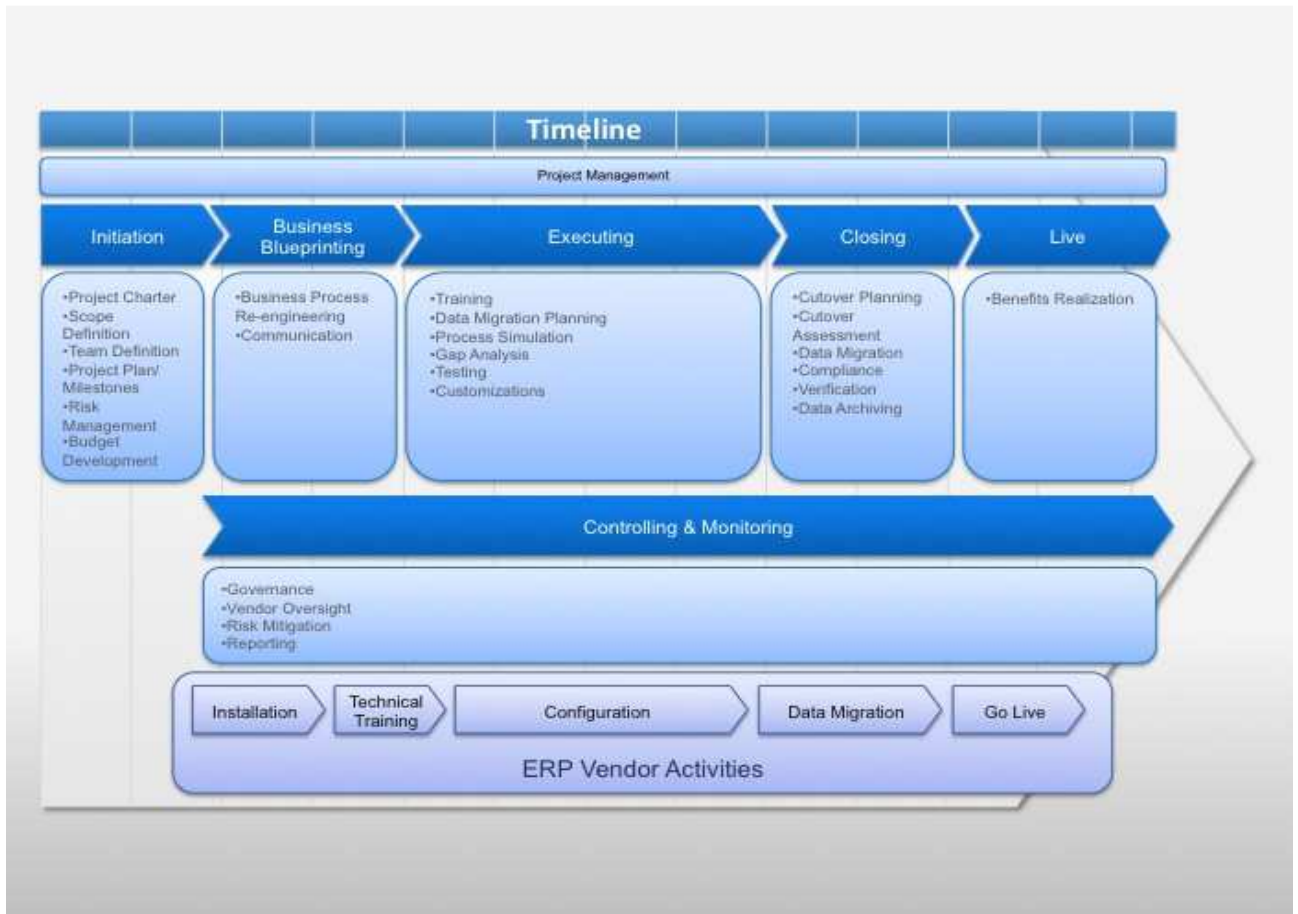


Figure 2.1 ERP Project implementation process Panorama-consulting.com

The whole project management process is viewed as a set comprising of a lot of activities for example ERP vendor activities, controlling and monitoring of the project. Figure 2.1 therefore depicts the ERP life cycle as comprising five phases namely initiation, business blueprinting, and execution, closing and going live.

### 2.2.3.1 The planned oriented approach

Guido & Pierluigi, (2009) contend that choosing an implementation strategy is not that easy, it depends on many of factors. These factors are grouped into technical and organisational issues. The strategy selection hence, depends on the capabilities of each organisation to deal with the issues concerned. Table 2-1 below shows critical areas, capabilities and respective indicators to which an organisation needs to rate itself against.

#### Hierarchy of technical issues

Critical Area	Capabilities	Indicators
Software Standardisation	Attitude to standardise the system	Software personalisation Software parameterisation
Software integration	Attitude to close legacy system	Number of legacy with function not supported by the ERP, that will not be closed Number of legacy with function supported by the ERP that will be closed Number of Legacy with function supported by the ERP that will not be closed
	Needed ERP size implementation	Level of integration legacy-ERP Business process coverage level with the ERP

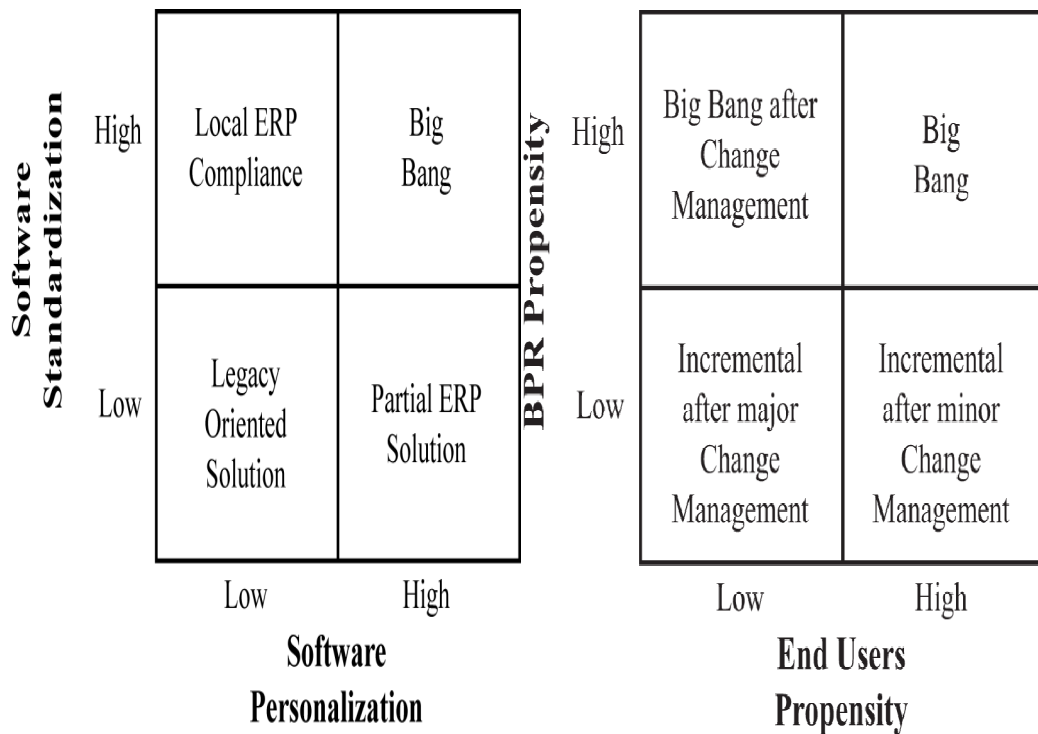
#### Hierarchy of organisational issues

Critical Area	Capabilities	Indicators
Business process reengineering (BPR) propensity	Process orientation of the organisation	Orientation of organisation and structure toward process Level of organisational flexibility Cross functionality of the individual objectives and performance Resources and systems to monitor process quality
	Project management capability	Cross functional project team Availability of potential project manager
	Capability to monitor the risk related to BPR	System to monitor resistance to change Skill development and job conversion activities
End users propensity	End users profiling	Educational background Experience in the use of information systems Frequency of job rotation
	Availability of change enablers	Human capital Commitment of top management Incentives towards innovative attitude

**Table 2-1A planned-oriented approach for ERP implementation strategy selection Adapted from (Guido & Pierluigi, 2009 p 10)**

Guido et al in **Table 2-1** shows that technical issues to do with ERP include software standardisation and software integration and the respective indicators are shown against which the organisation should rate itself. Organisational issues are to do with BPR and end user propensity.

After careful introspection by an organisation on the above factors then the following two matrixes can be developed so as to map the position of the organisation against recommended strategy for implementation as shown in **figure 2.2**



**Figure 2.2 Implementation strategy analysis. Adapted from (Guido & Pierluigi 2009 p 15)**

When an organisation has got low software personalisation and low software standardisation then, legacy oriented solution is preferred since this involves reduction and rationalisation of existing legacy system. When software personalisation is high versus a low software standardisation then, partial ERP solution is preferred where

some modules/sub modules are implemented. The other two quadrants proffer Big Bang approach and local ERP compliance were software personalisation and standardisation is high and where personalisation is low and standardisation is high respectively

Organisational assessment matrix plots end user propensity against BPR propensity. Based on the capabilities of the organisation the following strategies are offered;

### Big Bang

The Big bang strategy follows a scenario where there is high BPR propensity and high end users propensity. Since both end users propensity and BPR propensity areas are high, it shows that the organisation is ready for drastic changes at once hence the Big Bang strategy is suitable.

### Incremental after major change management interventions

Change management interventions are critical to pursue a successful implementation project and these are spearheaded by the human resources. The propensity to do BPR is now low given the major change that has already taken place this may be a retrenchment exercise and the user propensity is also low.

### Incremental after minor change management interventions

This strategy involves redefining organisational practices, roles and tasks. This creates the incremental implementation after minor changes are done hence there is continuous need to shape the future of the organisation.

Big bang after change management interventions: this involves radical change that entails re-evaluation of available skills, recruitment of highly skilled employees in project management and building a winning team (Guido & Pierluigi, 2009).

### **2.2.5.2 The risk framework management approach**

Dey, Clegg, & Bennett, (2010) developed a risk management framework model for implementing ERP projects. The model is based on five stages that include identification of risk, logging the risk, risk reviewing, management and finally closing the risk. The model is primarily concerned about being able to anticipate events and their possible impact and devising strategies to minimise negative impact of such events well in advance. The framework thus tries to avoid the surprise of being caught unaware when events unfold during implementation. A brief description of what each of the five steps entail is given below;

#### **Identification of risk**

This stage involves listing of all future events that have the probability of occurring and likely to cause some negative impact on the project at hand. These events may need to be managed through avoidance if it is possible to eliminate them or devising a strategy to minimise their impact when they finally occur. Risks can be identified using various models but in all the models involvement of key stakeholders is important. All concerned interested parties to the project should be consulted and their agreement on issues involved is critical to appropriate risk identification as these stakeholders have first-hand knowledge of their respective areas.

#### **Risk Logging**

All identified risks are recorded in a risk register and information pertaining that risk is then recorded against it. The information and data recorded about each risk will then be updated and reports produced as the project progresses according to plan. This is an important stage as all identified risks are logged and further action will be recorded against the risk as the project progresses.

#### **Risk reviewing**

After compiling the various identified risks into a report, concerned parties to the project need to review the report for accuracy of information before it can be accepted. The recorded risk together with their possible impact need to be carefully reviewed for

their probability of occurrence and possible impact on the whole project. This is vital to ensure that resources are channelled to deserving areas of high risk. This stage may be difficult especially when different parties do not agree on risk weights hence allocation of resources is staked.

### Management of risk

The identification of risk and their probability of occurrences and likely impacts culminate into finding ways to manage their impact on the project. The consultative process of stakeholder involvement helps in devising workable mitigation strategies. Well defined risks are easier to manage than those poorly defined. Devising risk management strategies usually demand extra resources that require management support and commitment.

Figure 2.3 below shows a graphical depiction of the risk framework model.

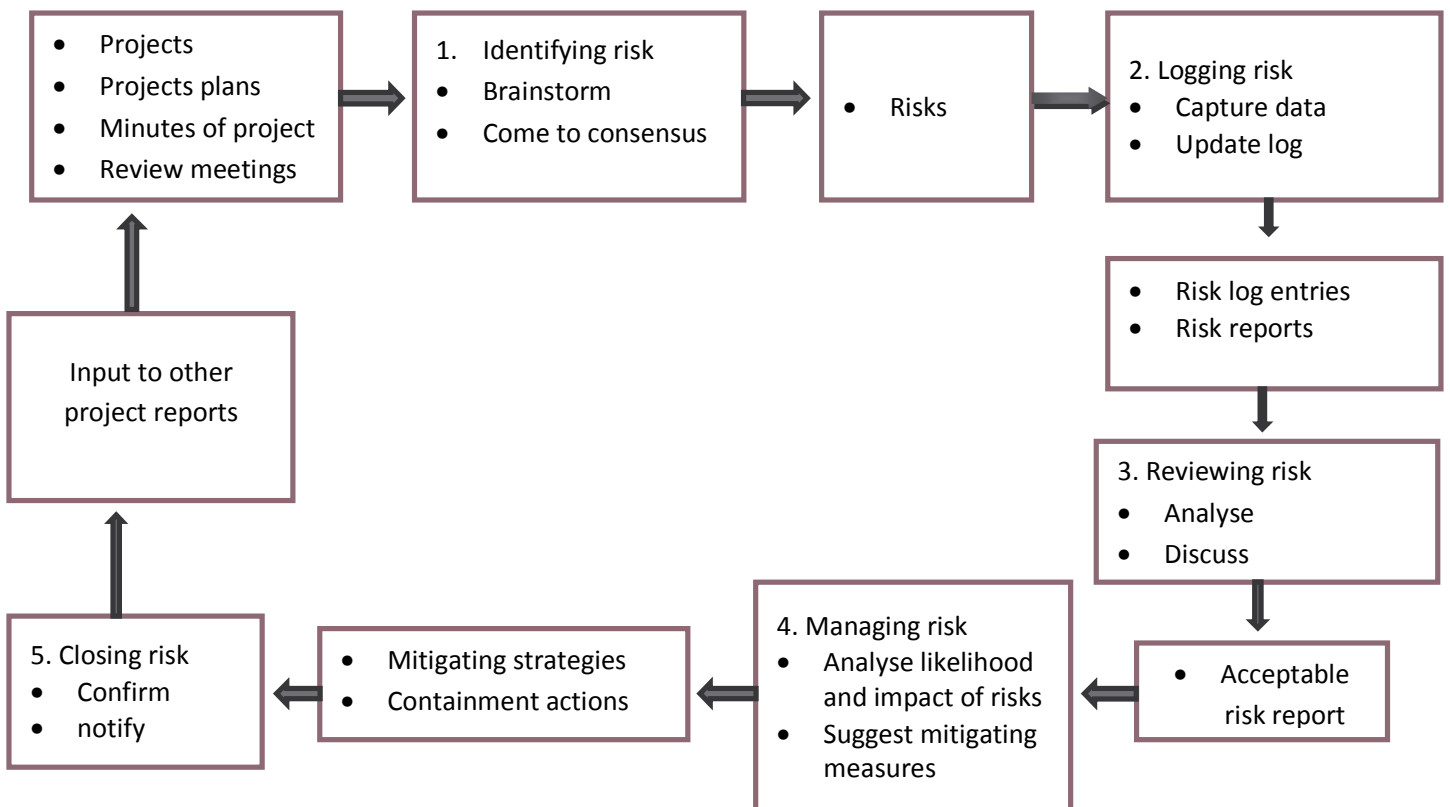


Figure 2.3 The risk framework management Adapted from (Dey, Clegg, & Bennett, Managing Enterprise Resource Planning Projects, 2010, p. 8)

### 2.2.5.3 The phased approach

Mabert, Soni & Venkataramanan, (2005), have pointed out that implementation timeframes and costs of ERP projects are affected by an array of factors. These factors stretch from planning, implementation to post implementation evaluation. According to Mabert et al, (2005) enterprises that stayed on track during their ERP implementation shared common organisational traits. These characteristics are grouped into implementation phases as shown in **Figure 2.4**. The phases I through V are related to each other according to Figure 2.4 where each phase contains elements listed in detail below:

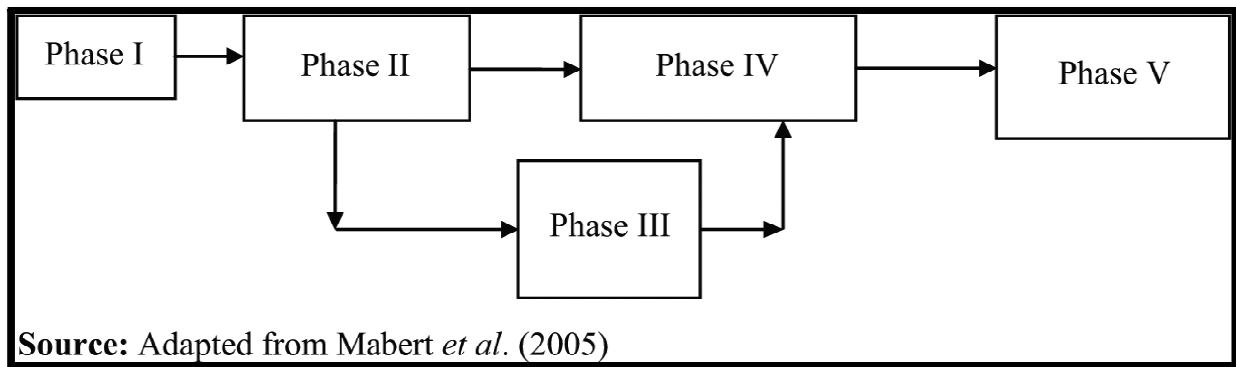


Figure 2.4 The phased approach to ERP implementation

#### **Phase I:** Feasibility study and adoption:

At this stage the company weighs the costs and intended benefits of going for an ERP system.

#### **Phase II:** planning variables:

This phase involves developing a strong case for adopting ERP package and outlines its intended benefits to the business at large including outwitting competition. It is important to make sure that there executive management involvement in the planning and throughout the implementation phases. Top management should be the flag bearers for the project. Planning as an integral part of the process includes having forecasts in place for change management, project team composition and assembling, how communication is to be handled and the channels thereof, system cut over

strategies including data conversion and integrity as well as infrastructure deployment strategies.

**Phase III:**Implementation decisions:

Implementation decisions need to be managed efficiently otherwise budget overruns will be experienced without any possible solution in sight. Companies need to decide about choosing between single ERP package and couple of packages that synchronise data. Once the decision has been made during implementation organisations need to decide on mode that is big bang versus phased modular approach. Plans have to be made and managed about whether there should be significant changes to business processes to match best practise methods in ERP or whether there should be customisations to the system to suit business processes.

**Phase IV:**Implementation management variables:

Companies that stayed on track managed to deal effectively on having top management support, good communication throughout the organisation and the project team, have ERP implementation teams that were empowered to make important decisions in the process, kept all outside stakeholders like customers and supplier informed about changes happening and finally the managed to train well all system users.

**Phase V:** performance and outcomes: companies that made it in implementation success made sure that completion time was well managed using different project management and budgeting tools making sure that stipulated return on investment in feasibility study is earnestly pursued(Mabert et al, 2005).

#### **2.2.5.4 The process approach to ERP implementation**

ERP adopters have obtained their returns in different distribution form such that it became a huge issue and concern for all small and large companies interested to get into the software. The implementation is based upon the following process oriented framework as developed by Small & Yasin (1997) as follows;

- a) Strategy formulation a stage when the vision, mission and long term goals and objectives of the organisation are clearly defined. Technology strategy is then crafted in-order to enable the organisation to attain its objectives. This is vital as it sets the direction the organisation is taking (Mehrerjerdi, 2010).
- b) Process planning and systems design follows, whereby business operations and processes are re-engineered with an intention to align them to business goals. This stage defines whether the business should change to suite the package or the system need customisation to improve system to organisational strategic fit.
- c) System appraisal and justification, where actual ERP systems are evaluated and objectively justified. This is an important phase as selection and justifying the investment provides foundation on which to measure rate of success or failure.
- d) System configuration follows, whereby the system and organisational process are configured so that an alignment is achieved between the two.
- e) System implementation follows, whereby resources are now deployed on ground to facilitate the actual implementation of the system. Poor project management can lead to a failed project even if the right system was selected for the organisation.
- f) Post-implementation evaluation, in which actual benefits of the system are compared to initially envisaged goals to determine level of success and possible areas of improvements (Small & Yasin, 1997).

ERP implementations have attracted the attention of researchers, consultants and the business community at large, with various models being put forward in a bid to realise the fruits of ERP investments. It is clear from the outline of the models aforementioned that almost all of them places prevalence on certain factors to be guarded against in ERP implementations. The factors have been named critical success factors or critical failure factors whatever the name is, it is important to scrutinise individually most identified factors. The following section of literature review scrutinises individual critical factors in ERP adoption and implementations.

#### **2.2.4 Critical Success Factors**

Critical success or failure factors are factors that have been identified as vital throughout the change process from legacy systems to ERP systems. In order for the organisation to achieve the seamless integration these factors need to be well addressed and in time. Koh et al, (2006) grouped factors relating to ERP implementation into critical success or failure factors, whereas matters relating to ERP integration were bunched together as total integration.

Critical success factors in implementing ERP projects hinge on some critical areas that include inter alia selecting the right system for the business; building an exceptional team that possess good project management abilities, proper management of change, good risk management skills, instituting BPR process to provide a better match with the best practise system processes; and managing hardware and software deployment process, data migration and integrity, and minimising system customisations.

On the other hand, factors relating to ERP integration included operationalisation, performance and evaluation; risk management; information and knowledge management; and cross functional integration of ERP and supply chain integration (Koh, Simpson, Padmore, Dimitriadis, & Misopoulos, 2006).

Furthermore, Somers and Nelson (2001) ranked ERP CSFs based on mean score and produced the following “top ten” factors;

1. Top management commitment and support
2. Project team competence
3. Interdepartmental co-operation
4. Clear goals and objectives
5. Project management
6. Interdepartmental communication
7. Management of expectations
8. Project champion
9. Vendor support
10. Careful package selection (Somers & Nelson, 2001)

The existing literature on ERP implementations and their success rates relates more to USA, Europe and the developed world (Zhenyu & Prashant, 2001). A handful of work has been done in developing countries and almost all of it relates to Asian and Latin American states.

There are two broad categories of factors that affect ERP adoption and implementation in developing countries that is national or external and internal or organisation specific factors. Among national or external factors are such factors as prevailing economic conditions and GDP growth prospects, institutions, and the legal environment has a profound bearing on IT adoption and ERP penetration rate. Developing countries usually suffer from substandard infrastructure in telecommunications, transport industries, internet; public database systems hence the low ERP penetration rates (Al-Mashari & Al-Mudimigh, 2003). ERPs are not stand-alone systems and thus they need to work in an integrated environment to the much promised seamless integration to the organisation's operations. Nevertheless, good infrastructure alone does not increase ERP adoption, hence there is need to consider additional factors like government policy on foreign direct investment and competition laws (Zhenyu & Prashant, 2001).

On the other hand, from an organisational internal view, small firm size, lack of IT maturity, and BPR inexperience all negatively affect ERP adoption propensity (Simon, Schoeman, & Sohal, 2010). Organisations usually are deficient on IT strategy and good project management experience. Consequently, a great deal of ERP adopters in developing countries is not local enterprises, but they are mainly multinational companies (MNCs). Small to medium enterprises (SMEs) play a pivotal role in national economies of developing countries. Hence, affordability and availability of ERP systems are a major concern. Organisations ideally lack alignment to process management and business process re-engineering experience that are needed to go with successful ERP implementations. Most off-the-shelf ERP systems impose their best practise logic on businesses, unlike past computer systems, thus requiring enterprises to alter the way they conduct business. (Zhenyu & Prashant, 2001).

Technology advancement has been on an upward trend in Africa as the world is fast becoming a global village. Integrated information systems have become a pillar of competitive advantage in the global markets hence there is a frenzy of African organisations adopting ERP programs. Despite their much enunciated benefits most of these ERP programs remains dreams for most of the organisations that undertake such programs (Panorama Consulting Group LLC, 2011). From the existing literature most of research has been done from successful companies' point of view, thus showing what can be termed stumbling blocks in the ERP implementation and how these have been solved. The success factors and the failure factors can be broadly categorised in the following;

## **Business Plan Vision**

There is always need for clear business plan, vision and mission to give direction to the project. A clear business model, a project mission, appraisal and justification of investment, and clearly acknowledged goals and benefits should be in place before embarking on an ERP project. Organisational preparedness regarding to technology deployments like hardware and software, training and education, maturity of current processes and promise to release and assemble a team of qualified and experienced members together with top management's commitment needs to be well managed. (Nah, Zuckweiler, & Lau, 2003) stated that, apart from the implementation process itself, the project leader face challenges from unsatisfied expectations from various stakeholders including members of the board, employees, management, customers and supplier. It is vital that project objectives are set well in advance before embarking on canvassing top management's support. Lack of clear plans has been attributed to many ERP implementations failures (Somers & Nelson, 2004). A business plan clearly showing potential strategic intended benefits, required resources, costs involved, associated risks involved and a projected timeline is important (Loh & Koh, 2004). Such a plan helps the project team to remain focused on promised potential business benefits. Clear business plan and vision translates into needs requirements, procedures for evaluating progress, and a tool to use for ascertaining a return on investment. These checks and balances tools are crucial in guiding an on-going organisational effort in implementing ERP projects as they sometimes exceeds the usual time frame for basic business projects (Wickramasinghe & Gunawardena, 2010). Clear goals and objectives are important especially in the early stages of the ERP implementation process.

## **Business Process Reengineering**

Business process re-engineering processes are directed at identification and improvements of critical operations, restructuring imperative non-value-adding activities and doing away with inefficient way of doing business. Business re-engineering efforts usually results in significant trimming of work, departmental restructurings, remarkable decrease in paperwork transactions and merging jobs and tasks previously done by different employees (Muscatello, Small, & Chen, 2003).

Change is inevitable in implementing an ERP system due to the fact that an ERP system that squarely fits a business' operations simply does not exist. Therefore, business process re-engineering (BPR), change management and system customisations are integral components of any ERP system implementation process (Koh, Simpson, Padmore, Dimitriadis, & Misopoulos, 2006). Off-the-shelf ERP systems generally impose their on working logic on organisational sub-units demanding that adapt to the best practise logic of the system to fit the needs of the software thus vanilla implementation. The ERP based best practice line of reasoning suggests that ERP-driven changes to business processes yields positive results for adopting organisations (Helo, Anussornnitisarn, & Phusavat, 2008). The dependability of software vendor is extremely important factor in determining the success or failure of ERP customisation process.

Thus, selecting an ERP package is by far more than just purchasing software, it involves accepting the software vendor's best practices for your company's business processes. Companies that implement ERP systems must be prepared to grapple with the ERP supplier's underlying assumptions on the business and its processes and be ready to make adjustments to the standing processes for conformance with the assumptions. This, therefore suggest that BPR can either be driven by the company itself or by the chosen ERP packages (Mohammed, Kulonda, Jones, & Proctor, 2005).

## **Vendor selection**

Vendor selection is mainly an internal process that is conducted by the software evaluation team after the demonstrations by vendor of how their systems match the requirements of the organisation (Maguire & Udechukwu, 2010). The sticky points in software selection are premised on the robustness of the system, costs, conformance, implementation, and data migration, capacity of the vendor and consultant and the system's ability to match the organisation's processes. Ponis, Tatsiopoulos, Tsitsiriggos, & Christou, (2007) noted that vendor selection is one of the critical matters in implementing ERP systems. Whereas most researches on implementation start when the vendor is already selected it has been noted that wrong vendor selection can lead to delays in implementation and failure to attain target as the system that do not match the needs of the client may need heavy customisation (Palanisamy, Verville, Bernadas, & Taskin, 2010). ERPs are expensive investments and rushing to implement ERP systems without proper due diligence can have serious implications for a business. ERP implementation projects like other company projects have their drawbacks and their success is hinges on commitment from senior management (Akkermans & Van Helden, 2002).

## **Data Conversion and Integrity**

IT systems operate on a garbage-in garbage-out principle implying that the quality of information that is entered into the new system is an important factor to consider. Data migration process should ensure that transferred data is accurate and free from errors. Inconsistencies that emanate from data integrity challenges can trigger prolonged implementation deferrals (Nah, Zuckweiler, & Lau, 2003). Thus, managing data that is fed into the ERP system becomes an important factor that needs constant attention during the ERP implementation project (Muscatello, Small, & Chen, 2003). Information and data that is transferred from legacy system to the new ERP system during data migration should be of unquestionable quality. Provision of timely accurate data in a specified acceptable format boosts the success chances of a new system implementation process (Somers & Nelson, 2001) and (Zhang, Lee, Huang, Zhang, & Huang, 2005). The ability of the project team to ensure that data integrity and accuracy is guaranteed

during data migration ultimately determines the success the project. High levels of data integrity cannot be achieved without data cleaning process which forms a constituent part of data migration phase.

### **Consultant support and knowledge transfer**

Consultant support has been pointed out as an important element that determines success of ERP implementation projects. Because enterprise systems are complex and large, there should be smooth knowledge transfer from the consultant to company's employees. Knowledge transfer is critical at the implementation phase as that facilitates reduction of skills gap of users of the system. Consultants have direct impact on performance through sharing knowledge with various members of the organisation (Soja & Paliwoda-Pekosz, 2009) while other writers focus on the organisation itself as a facilitator of the knowledge transfer than to place the whole load on the consultant (Maguire & Udechukwu, 2010). Companies that adopt ERP system need to improve on their knowledge management capabilities to facilitate successful knowledge transfer from consultant to company's employees' takes place (Nonaka & Takeuchi, 1995). Organisational way of operating, culture, form and structure should be strengthened to address knowledge transfer process. Chan, Walker, & Mills, (2009) argues that proper practise of knowledge management principles places organisations into advantageous positions poised for success in ERP projects. Hurdles that external consultants find difficult to deal with include; employees' resistance to change and training and that is so because of organisational barriers like culture (Mohammed et al, 2005). ERP knowledge like any other form of knowledge is best transferred using informal personal interaction of people in various groups that share passion and trust. From the study of failed ERP SAP R/3 Comp Group, it was noted that it is important to have knowledge transfer programme in place such that company employees are well versed with the system when the consultant finally leaves the organisation (Al-Mashari, Al-Mudimigh, & Zairi, 2003).

## **Top management commitment and support**

Maguire et al. (2010) argue that, unlike some researchers (Akkermans & Van Helden, 2002),(Al-Mashari et al, 2003)in this area, top management commitment and support plays a lesser role to play in ERP implementation than users as top management focus on mainly conflict resolution. Wang, Lin, Jiang, & Klein, (2007) also echoes the same sentiments that users' acceptance is an important factor in successful ERP implementation. This view lacks depth in terms of analysing the role that top management plays in such disruptive technological changes that forever change the way organisations operate. Top management is the beacon of change in organisations hence they are of great vitality in the success of such projects. Without proper business process reengineering, change management and training implementing a new system becomes a mammoth task to achieve successfully(Akkermans & Van Helden, 2002).

## **System customisation**

Davis (2005) defines customisation as change of system code brought about by the existence of a misfit between embedded ERP process logic and desired organisational process. These necessary changes are caused by "misfits" between business processes and the ERP systems processes. The organisation-ERP "misfits" are grouped into data, process and output categories(Soh, Kien, & Tay-Yap, 2000).

Customisation has been outlined as a major factor that prolongs ERP implementation thereby increasing the risk of failure immensely. Most system vendors go to greater lengths in trying to convince client to change their way of doing business in order to minimise the level of customisation that need to be done to the system thus they are in preference of vanilla implementation. Mamoh et al. (2010) found out that customisation is the biggest contributor to failure accounting for 13% of failed ERP projects. In other works, there arose arguments that those organisations that customise heavily are more likely to fail than those that do not require too much customisation(Wickramasinghe & Gunawardena, 2010). There is need for flexibility in ERP processes to fit business processes and to some extent most ERP adopters customise their ERP software. In most cases customisation costs come as a surprise to most organisations(Panorama

Consulting Group LLC, 2012). Customisations should be kept to important areas where the organisation derives competitive advantage(Wickramasinghe & Gunawardena, 2010). Problems of customisation do not end with implementation but they extend to maintenance and systemupdates(Kimberling, 2012). Many updates are not compatible with customisations because of code changes thereby these customisations deprive organisation of new developments in the system leaving them with out-of-date systems.Customisations are in varying degrees and research from Panorama is insightful into the degree of customisations that customers undertake see **figure 2.5**;

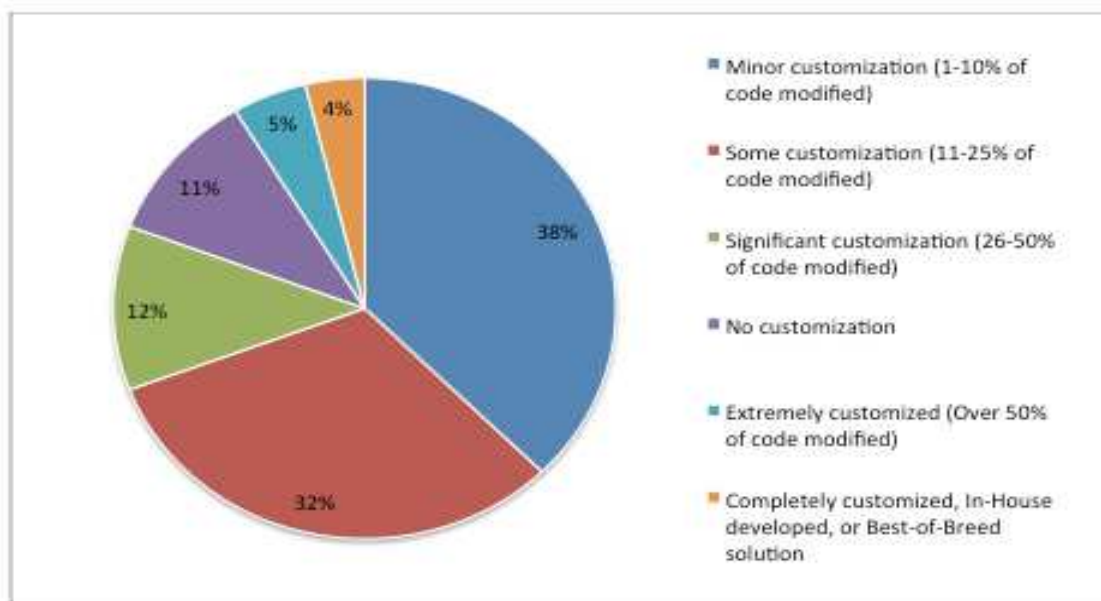


Figure 2.5Degree of ERP customisation. Adapted from Panorama consulting group 2012 ERP report.

It is evident from the pie chart that most vendors encourage clients to adopt ERP packages as they are but because the processes do not perfectly match business processes customisations are inevitable. About 70% of ERP adopters get involved in some customisations which are minor in nature.

### **Lack of change management**

Mamoh et al. (2010) contends that poor change management activities are the second largest factor that facilitates ERP implementation failure though his research was mainly based on searched journals on the subject. Aloini, Dulmin, & Mininnoa, (2007)advises that underrating the amount of effort and resources required in change

management processes can result in failed projects. Conflict that may arise between various stakeholders militates against smooth implementation of the new system. Change management is an important factor that distinguishes successful and unsuccessful ERP implementations (Aloini et al, 2007). Identifying potential organisational issues at planning phase helps companies to smoothen implementation. Issues to contend with include reduction in staff, changes in roles, resistance to redeployment and training. Once the likely issues are identified it is important to institute actions at an early stage than to wait and deal with reactionary actions that are likely to delay the project. According to the Panorama Consulting (2012) 63% of surveyed companies experienced difficulties in addressing process and organisational issues thus bringing the factor to the fore of critical issues that demand management's attention.

### **2.2.5 ERP Experiences**

Organisations that implement ERP systems have had various experiences from the investments. These range from realisation of full ERP benefits, partial benefits to total failure and loss. The world class producer of turbine engines, Rolls Royce, successfully implemented ERP solution meant to distinguish itself from competition. Rolls Royce used the risk management framework in implementing their ERP (Mehrerjerdi, 2010). In the case of Texas Instruments, a manufacturer of a wide range of devices, their successful implementation of SAP helped them to become a global giant and managed to address issues that had been bedevilling them that included on time delivery and better response to customer needs and achieved reduction in inventory the implementation phase was managed through the process oriented approach of (Small & Yasin, 1997).

In the distribution industry in Barbados Islands, SBI Distribution (SBI) which is a product of three merged firms sought an integrated system to manage its vast information; legacy systems were failing due to regular crashes resulting in the business incurring unwarranted costs and loss of business. With the implementation of Sage 300 ERP complete suite, SBI managed to enjoy the following benefits; improved delivery time by one day, reduced invoicing time by 7 hours 45 minutes to 15 minutes, attained five

months payback period, saved \$1 million in a year previously lost sales; 80% reduction in credit notes (Sage North America, 2012).

In the USA beverage industry Ponzi Vineyards required to launch a web portal store, improve transaction processing speed in shops and integration of the whole supply chain of the wine production. This was possible due to the adoption of Sage 300 ERP that helped Ponzi Vineyards with the required integration thereby effectively serving their customers. As a result the online based ERP gave the company a firm grip on business operations, improved the numbers of satisfied customers and increased sales volumes due to their presence on the internet. (Sage North America, 2012)

Apart from private sector companies, government departments are not left out of the ERP frenzy, the County of Essex in southern Ontario has business operations in agriculture, manufacturing and tourism. After a rigorous introspection the County found out that it needed to effectively manage its finances producing compliant financial reports to authorities and these came to fruition by adoption of Sage 300 ERP that resulted in efficient real time operating environment with improved compliant reports. (Sage North America, 2012).

Despite the much publicized benefits of ERP systems, the realisation of the benefits remain a dream for many as these complex systems are not easy to implement and in most cases results in failed projects (Schoenherr, Hilpert, Soni, Venkataramanan, & Mabert, 2010). The complexity of ERP system is positively related to its failure. Enterprise system complexity varies directly with a number of factors namely; process complexity, product complexity, competition, international orientation and customer base (Schoenherr et al, 2010). As the processes that need to be performed by the ERP system become more complex the solution itself needs to be complex to match the problem it is intended to solve. Some products are simple while others are complex simple products would require a relatively simple solution and vice versa hence product complexity impacts on ERP complexity. Competition is one such determinant of complexity in that if competition is high there is need to develop highly specialised

systems to outwit opponents. Competition is analysed using Porters' five forces hence we see integrated systems catering for the supply chain and customers throughout the value chain of the business(Laundon & Laudon, 2009).

Businesses that are present in the international markets are more complex as they adapt to differing operation environments both in terms of markets and legal environments. These businesses operate complex ERP systems to cater for all their business needs. Consequently more complex systems are likely to be found in international oriented businesses than their domestic counterparts. The last determinant raised was that of the customer base, broad versus focused customer bases. A company serving a broad customer base would need a more complex system to capture and synthesise all customer information and varying requirements as opposed to a company serving a focused base of customers(Schoenherr et al, 2010).

Due to their complexity ERP systems cannot be simply viewed as IT projects but as breakthrough technologies that change the playing field in business. Organisations seem to underrate challenges relating to organisational implementation issues and instead devoting more attention on technology related implementation issues that are technical in nature(El Amrani, Rowe, & Geffroy-Maronnat, 2006)

ERP failures cut across the organisational sizes continuum, perhaps the most published ones pertain to big organisations where the cost runs into millions of USD and even past the billion dollar mark. The prominently publicised failures have highlighted that organisations go through really tough times in ERP implementation. Because of their limited resources, SMEs usually are less likely to successfully weather their way through a failed ERP implementation storm as compared to big organisations. For that reason, particular attention must be paid to the process of collecting and evaluating potential and appropriate ERP packages so as to boost probability of a successful project(Muscatello, Small, & Chen, 2003).

Organisations should carefully consider all the technical and organisational factors in choosing an ERP implementation strategy. When organisational and technical factors are not exhaustively identified and projected, they will start to crop up once implementation work has begun, hence negatively impacting implementation progress and escalating the probability of project failure(Guido & Pierluigi, 2009).

There are a number of publicised ERP failures and these include; Allied Waste Industries, Inc. which had to abandon and dumped its \$130 million SAP R/3 system, Waste Management, Inc., a trashhauler company, threw in the towel after spending about \$45 million SAP ERP system installation. In yet another deal gone sour, Hershey Food Corporation held SAP accountable after its failure to capture brisk business due to botched SAP ERP implementation. ERP investments have grown over the years and some of the huge investments are running past the one billion dollar mark. ERP failures have turned nasty with lawsuits flying all over the alleged failures, companies no longer can keep quiet after huge investments fail and threaten their company's wellbeing. Faced with the imminent failure of the ERP project, the US department of defence had to divert attention to possible key learning points taking the experience as a learning curve. The U.S. Air Force has finally decided to scrap its Expeditionary Combat Support System (ECSS), after spending past a billion dollars mark during the seven years of development and implementation producing a system which it admits as having no "significant military capability," Defence World reported(Charette, 2012).

The ECSS project was embarked on in 2004 with the intention of replacing two hundred and forty out dated legacy systems with a single seamlessly integrated system aiming at the Air Force to produce auditable set of financial records, something it had failed to do since 1947. Analysts say that it was evident given the slow rate of progress on the ECSS system since 2004 that the project was going to fail(Charette, 2012).

On another deal that turned sour Avantor Performance Materials sued IBM for fraud and breach of contract, as a result of failed SAP system. Avantor, which filed the complaint November 2012 with the US District Court, is seeking tens of millions of dollars in damages from ERP system vendor IBM. Avantor's complaint outlines that IBM, which was chosen so as to upgrade Avantor's global legacy systems to a SAP platform, did not come out clean on the capabilities of its exclusive Express Life Sciences software solution, thus contributing immensely to a failed implementation at its US business sites(Curtis, 2012). Avantor alleges that the poor service and support offered by IBM during the implementation phase showed beyond reasonable doubt that it was grossly misaligned with their requirements and those of their customers(Curtis, 2012). The IBM lawsuit shows that companies are now being aggressive on what ERP vendors claim their offerings provide for the company but due to complexity of ERP systems prosecution takes time and is usually difficult.

The next section looks at ERP adoption in Zimbabwe.

## 2.2.6 ERP Adoption in Zimbabwe

Zimbabwean companies have not been left aside as the tide of ERP sweeps through. There has been adoption of various ERP software and financial software repositioning their brands as ERP like what Pastel did. Most used ERP systems in Zimbabwe are Syspro, Sage X3, SAP, Baan, and NavDynamics. Some of the companies known to the researcher that are running on ERP are Delta Beverages running on Syspro, Turnall Fibre running on Dynamics Nav, Lonrho Zimbabwe running on Baan, Dairibord Holdings Zimbabwe running on SAP and Beinstein Clothing running on SAGE X3 just to mention but a few.

In Zimbabwe the bulk of the ERP adoption has been driven by obsolete legacy systems, broken down business systems, the need to tap into the best practices entrenched in enterprise systems thus taking advantage of ERP's proven track record of functionality to improve information availability and decision making. Hence most of our ERP implementations fall into the 72% that is focused on software rather than focused on business process reengineering and organisational change to gain competitive advantage as shown in **Figure 2.6**. It should however, be noted that some companies with the use of business intelligent systems are gaining competitive advantage so there is no distinct line demarcating the phases as the company progresses through.

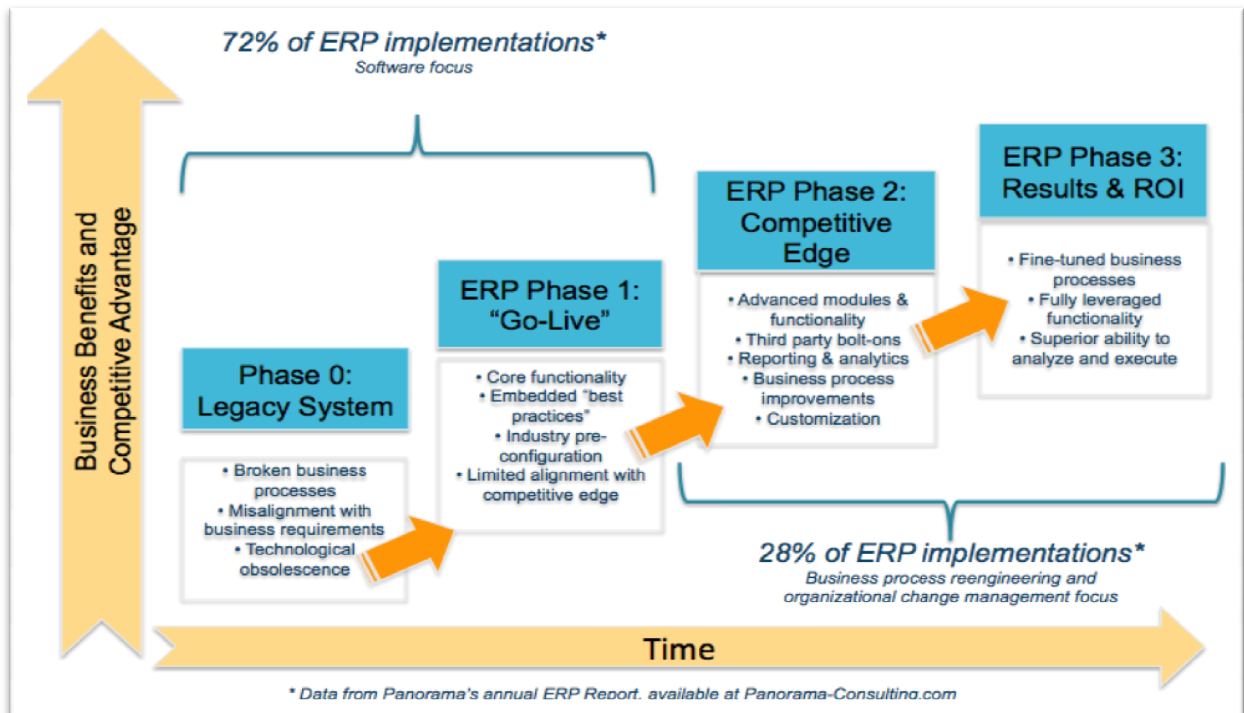


Figure 2.6 ERP Adoption Focus 2012 adapted from Panorama 2012 ERP Report

Figure 2.6 shows that the bulk of companies that adopt ERP system are heavily focussed on legacy systems and core functionalities that is the go-live phase accounting for 72% of surveyed companies. The remainder 28% of companies adopt ERP system aiming more on competitive edge and realisation of envisaged benefits.

## 2.3 CHAPTER SUMMARY

The chapter has discussed ERP systems, their adoption and selection processes, known failures and implementation models together with identified critical success factors from mainly developed world and successfully implemented ERP systems perspectives. However, the available literature is weak because it does not answer the research objectives outlined in chapter 1; hence this study which seeks to review causes of ERP implementation challenges from a Zimbabwean perspective. The next chapter discusses the research methodology adopted in this study.

## **CHAPTER THREE**

### **3.0 RESEARCH METHODOLOGY**

#### **3.1 INTRODUCTION**

This chapter consists of three main parts that discuss research design, data collection and analysis procedures. The first part covers the rationale of adopting a single case study design plus justification focusing phenomenological philosophy in the case study approach. The second part reviews on sample selection and carries an explanation on primary data collection activities, mainly from personal interviews with senior staff at The Wattle Company and observation of processes, and secondary data collection from archival documents. The last section of the chapter discusses data analysis techniques, issues to do with validity, reliability, research ethics and limitations of this study.

#### **3.2 RESEARCH DESIGN**

The research intends to employ both qualitative and quantitative methodologies thus the mixed approach. Using quantitative and qualitative methods jointly enables researchers to explore and unpack complicated aspects and relationships between humans and their social world (Malina, Hanne, & Frank, 2011). The design fit well since the adopting and implementing ERP systems is a complex process (Schoenherr, et al, 2010) this proved to be the most suitable design to apply. One main benefit of using mixed method design lies in its ability to allow researchers to revisit qualitative data during the projects, re-reading and contextualising quotes to the whole set of data (Grafton, Lillis, & Mahama, 2011). Case studies seek to explore and further enable understanding of an existing developed theory via some form of controlled experiment. Case studies are an important tool for researchers to vindicate or refute developed existing theories or to develop their own new theories. Given the important role of case studying in broad

research field, careful consideration should be therefore given to research methodology for collecting data, the selection of cases to be studied and the way how data is analysed and interpreted (Grafton et al, 2011).

### **3.2.1 The Qualitative Methodology**

Qualitative skewed case study design was used because it suited the research environment at The Wattle Company. The major aim of a case study is getting a thorough understanding of a phenomenon (Leedy & Ormrod, 2005). Interviews, questionnaires archival research and focus group discussion were used as data collection means. The qualitative case design well-suited the ERP implementation research at Wattle Company since the study sought an in-depth understanding of implementation challenges at the company

Semi-structured interviews were chosen to enhance chances of acceptance by management since at high management levels there are always more pertinent issues to attend to than answering long questionnaires. This afforded the interviewer to observe non-verbal language and gestures that accompanied answers that were given about ERP system in The Wattle Company. Semi-structured interviews afforded interviewees with an opportunity to describe the phenomenon in their own words hence being comfortable and producing candid responses.

### **3.2.2 Quantitative Methodology**

Given that the implementation had already happened the study used the ex post facto positivist design methodology in identifying and determining the degree of agreement and or disagreement regarding to the identified critical success factors that underlie successful ERP system implementation. Ex post facto strategy is adopted so as to examine the level of cause and effect of one independent variable on a dependent one such as the impact the process of ERP customisation or top management support may possibly affect the ERP implementation failure (Leedy & Ormrod, 2005). During the study conditions that had already occurred were scrutinised, data collected to

investigate a possible relationship between those conditions and the results. This analysis of past events was adopted with the aim of establishing if identified CSFs had impact on ERP implementation success.

### **3.3 RESEARCH PHILOSOPHY**

According to Galliers (1991), research philosophy involves beliefs about how data about phenomenon should be gathered, analysed and used. Research philosophy is also defined as the advance of knowledge and the nature of that knowledge (Saunders, Lewis, & Thornhill, 2007). Epistemology, what is known to be true, versus doxology; what is believed to be true, includes numerous research approach philosophies. Saunders et al (2007) identified four research philosophies which include Positivism, Realism, Pragmatism and Interpretivism. Two major research philosophies are positivism and phenomenological.

#### **3.3.1 Positivism**

Positivists accept as true that reality is stable and thus it is possible for it to be observed and described objectively without interference of the researcher and the research subjects (Levin, 1988). Positivists agree that isolation of phenomena under study is vital and that repeatable results of observations must be achievable. The process usually entails manipulating reality by introducing variations to an independent variable with the aim of detecting symmetries and connections elements included in the broader social realm of study (Saunders et al, 2007). The establishment of patterns of relationships in research elements thus enables predictions to be made. The society is so much engrossed in the positivism line of thinking to such an extent that knowledge claims not based on positivist line of thinking are rejected as invalid for not being scientific. Positivism is strong in collecting large sums of data, greater control of research process and producing easily comparable data whilst it is weak in that it is inflexible, does not understand social processes and often it does not discover meanings people attach to social phenomena (Saunders et al, 2007).

### **3.3.2 Phenomenology**

Phenomenologists agree that full understanding of reality can only be achieved via subjective interpretations and interventions in that reality (Leedy & Ormrod, 2005). Understanding phenomena in natural or original settings remains critical to the phenomenology philosophy and the acceptance that researchers and the researched subjects are intricately related thus researchers cannot avoid impacting those phenomena they study. Phenomenology is characterised by a focus on the meanings that research participants attach to a social phenomenon that is an attempt by the researcher to understand what is happening and why it is happening attaching context to events as they happened (Saunders et al, 2007). Interpretivists accept that reality can be interpreted in different several ways, but uphold the belief that those interpretations constitute the scientific knowledge being pursued in research (Miles & Huberman, 1994).

### **3.3.3 Research philosophy for this study**

As the study sought to answer the research questions about how and why organisations buy ERP systems and what factors underlies successful ERP implementation, the interpretivism philosophy has been largely adopted for this research. The research reckons that the ERP implementation process cannot be separated from and be described from an objective viewpoint. This is largely because the subjects interact heavily with the process and different meanings and interpretations are attributed to the same phenomenon of system implementation.

### **3.4 RESEARCH STRATEGY**

The study adopted the case strategy. A case study seeks to empirically explore an existing phenomenon in its real life setting; mainly where precincts between phenomenon and the environment setting are blurred (Yin, 2003). By exploring existing phenomenon in its reality context, case studies results can be used to fortify existing theories in the area under study. There are various purposes for carrying out case studies including; exploring case to appraise feasibility of research procedures, descriptive case studies that seeks to fully describe a phenomenon in its real life settings and explanatory case that seeks to unravel cause-effect relationships in explaining how events unfolded.(Yin, 2003)

Additionally, Yin (2003) advocates case study selection depending on the basis of whether; the single case serves an important example that is it will be unique, or the case is typical or representative of a wider group of cases, or the case is revelatory where there is a possibility to closely explore and analyse an otherwise inaccessible to scientific research phenomenon. According to Seuring, (2008) case study research has been fully developed and the research process can be carried out and documented in a rigorous way.

Apart from offering in-depth understanding of the phenomena case study strategy is not without its pitfalls. The greatest concern about the use of the case study has been the lack of rigor (Yin, 2003). This study was thorough in data collection and analysis and interpretation by using different avenues to collect same data making sure that it collaborates. However, White (2000) defends the use of case studies asserting that people fail to differentiate a case study research from case studying teaching. Case study teaching may involve making alterations to the research material in order to demonstrate a concept more effectively, which however is not permissible in case study research. Case studies have also been critiqued because they provide little basis for scientific generalisation. However, case studies just as they relate to other experimental researches should be generalised to existing proposed theories and not to populations

or universes (Yin, 2003), the case study therefore should not be taken as a sample but the its goalsentail expanding and generalisingtheoretical propositions and not enumeration of frequencies.

### **3.5 POPULATION AND SAMPLING TECHNIQUES**

Existing literature on ERP systems accepts that, unlike other company's IT projects, ERPs are different hence their success evaluation should be done by implementation project team members (Hong and Kim, 2002). This adds some need for some degree of involvement in the implementation process and specialty areas of the firm. Implementation project performance is normally defined according to attainment of set objectives, that customarily encompass parameters like clarity, system accuracy, timelines, content, system stability, flexibility, reliability, (Wu & Wang, 2007), completion of the project within budgeted timeframe (Al-Mashari, Al-Mudimigh, & Zairi, 2003)together with the realisation of business strategic goals.

In line with literature the target population was the entire Wattle Company ERP project team members who were directly involved in ERP implementation. The targeted population was 11made up of ERP project implementation members who had left the organisation and those who are still in employment of the case company.The population included key members who are the Finance manager, IT manager, analyst programmers and rest of ERP project team members. The chosen target population best suited the concentration required by the study, which focused on how organisations buy ERP system and their subsequent implementation process.

#### **3.5.1 Sampling and Sampling Size**

Following the technicality of ERP implementations purposive sampling was the best way to get the required information from the respondents. This saves time and does not invite unrelated and baseless arguments to the phenomenon at hand(Flom, 2011).

Maximum variation sampling was adopted which includes looking for units of individuals who satisfy requirements in terms of views being sought and positions related to the phenomenon under study and thus the inclusion of previous project team members and other parties who were identified as key members of management. (Palys, 2009).

The advantages of purposive sampling are limitless. One can eliminate candidates that are out of the equation from the study easily, and include those that are most suited for the study. Purposive sampling is accurate and has a solid systematical approach that would quickly lead to the main targets in less time (Saunders et al, 2007). The project team member list was readily available and all were easily contacted by email drastically reducing the cost of the research work.

### **3.6 DATA COLLECTION METHODS**

The researcher used archival research, questionnaires, semi-structured interviews and a focus group discussion for collecting data. The methods and instruments used are discussed individually in turn as follows;

#### **3.6.1 Archival Research**

Saunders et al, (2007) asserts that archival research strategy uses company documents and administrative records as its source of primary data. Archival research makes use of readily available data within company's documents thus making use of secondary data. When such secondary data is used in archival research will be analysed because the data is as a result of daily business operations and not for the study at hand. The analysis of secondary data makes the data part of the reality being studied. Documentary evidence was inevitably part of this study because there was documented evidence that captured events that were happening during ERP implementation process in the company. The documents were in the form of minutes from project meetings emails and purchase requisitions.

Archival research permits research questions that focus on the past and possible alterations that would have occurred over time to be answered Saunders et al, (2007). This auger well with phenomenological philosophy whose principles revolves around describing as lived experiences any given phenomenon under study. To this end, the researcher's ability to answer the research questions from archival data depended on the nature of the archival records and documents, their availability and accessibility and completeness.

### **3.6.2 Semi-structured interviews.**

Kahn and Cannell 1957 as quoted by (Saunders, Lewis, & Thornhill, 2007) define an interview as being deliberations between two or more people for a given purpose. There are different types of interviews that any researcher has at their disposal and these include unstructured, semi-structured and structured interviews. Structured interviews are standardised since all interviewees, in a more or less identical way, are subjected to the same questions. Semi-structured interviews are non-standardised but the researcher had themes and questions to be covered even though these varied from one interview to another whereas unstructured interviews are informal usually used to explore general areas of interest (Saunders, Lewis, & Thornhill, 2007).

#### **Motivation for semi structured interviews**

##### **Nature of research**

In conducting the research the phenomenological approach was used hence the explanatory form of the research work. To this end semi-structured interviews provided the best way of harnessing required information from respondents and affording the researcher a chance to further probe on answers and seeking clarification where it was needed.

##### **The need for personal contact**

Managers are more willing to be interviewed than to fill in a questionnaire where the area being researched is relevant to them and is of interest (Healey, 1991). The area of

research being technology implementation, many respondents were enthusiastic to share their experiences.

#### Nature of research questions

Because interpretivism requires respondents to explain experiences lived, most of the questions were designed in such a way that they were open ended. These types of questions are better answered via interviews as there is room for probing unlike using questionnaires where there will not be no chances to seek clarification and spaces provided may be inadequate hence getting partial answers.

#### Time and completeness of process

Semi-structured interviews were used due to their ability to harvest vast high quality information. A well conducted interview can get the researcher so much information in a short space of time unlike a long questionnaire. Respondents were also sceptical about giving out sensitive information via questionnaire so by creating a rapport in interviews respondents opened up on sensitive data. The interviews were not recorded to enhance openness whereas notes were taken.

### **3.6.3 Questionnaire**

A questionnaire is defined as a general term that encompasses all practices of collecting data whereby respondents are asked the same set of pre-determined questions (Saunders et al, 2007). There are various ways in which questionnaires can be administered broadly categorised as self-administered questionnaire and interviewer administered questionnaire. Self-administered questionnaires are usually distributed through the internet and intranet media, posted to respondents or administered in person. On the other hand, interviewer administered questionnaires normally take the procedure of asking questions over the phone or can be managed by way of structured interview.

The researcher administered 10 questionnaires to various project team members via email. The questionnaire distributed was designed to identify critical success factors for implementing ERP projects. This was important in trying to match critical success factors identified during the review of related literature and the phenomena at the case company. The detailed questionnaire is attached in Appendix A.

#### Merits of using a questionnaire

Questionnaires are used because of the following major advantages that are given by Saunders, Lewis and Thornhill (2007): firstly questionnaires gives respondents flexibility on how and when to answer the questions thus likely to harness well thought answers and useful data. Secondly questionnaires also enable respondents to provide answers without bias that often arise when engaging in face-to-face conversations. Thirdly the use of questionnaires enables the researcher to cover a much larger proportion of the sample within a short space of time unlike in interviews. The questionnaire mainly helped the researcher to reach out to those project members who are no longer employees of the case company more easily and covered much ground.

#### Demerits of a questionnaire

Despite well documented merits and being the key instrument used in research, the questionnaire is not without its shortcomings. These flaws include inter alia; the possibility that some questions will be left unanswered and these may be key questions in the research, questionnaires do not allow for further probing as is the case with face to face interviews hence no further clarifications in case of ambiguous responses, distribution of questionnaires may prove to be a costly exercise especially when they are printed and posted where the sample is dispersed and considerably huge and lastly the design of questionnaire may be limiting if spaces provided on the questionnaire may not be enough for detailed responses, resulting in collection of partial responses (Saunders, Lewis, & Thornhill, 2007). The collection of the questionnaires took time as respondents were busy with other work related issues. All questions were completed in full.

### **3.6.4 Focus Group Discussion(FGD)**

A focus group discussion can be defined as entailing deliberations between a group of people aimed at reinvigorating reminiscences, feelings, and discernments concerning a specific focused topic (Krueger & Casey, 2000). FGDs provide a strong avenue through which evaluation and testing of ideas is made possible (McNamara (2006)). Focus groups essentially consist of simultaneous interviews of 6-10 people (Saunders et al, 2007). The researcher managed to get valuable information and was able to test information gathered via questionnaires and interviews from the group discussion. A focus group team can be assembled pooling participants from various levels in an organisation with varying backgrounds all with shared interest of the subject matter.

The Wattle Company focus group was drawn up with the aim of exploring the experiences of Adempiere ERP System implementation. The preparations for conducting The Wattle focus group discussion were done according to steps drawn by Simon (1999). The focus group discussion conducted composed of six members. The members included key personnel as IT manager, accountants, sales officer, purchasing and an auditor. The focus group was adequately diversified hence it was balanced and issues discussed were wholesome. The focus group discussion was mainly used as triangulation tool against information gathered in interviews and from questionnaires. The discussion was fruitful in that areas that were technical were explained and contributions were informed and rational.

### **3.7 DATA ANALYSIS TECHNIQUES**

Analysis of data involves the examining, classifying, tabulating and or the fusing of data in a bid to answer the study questions (Yin, 2003). There is no standard format in data analysis in qualitative research. The data that was collected from the research respondents was therefore analysed on excel through the use of data displays. Analysis involved deciding what and which meanings could be attributed to the words and what inferences can be made in relation to the phenomenon under investigation (Miles & Huberman, 1994). Qualitative data from questionnaire was analysed by going through all the questions and establishing common themes, patterns and relationships (Miles & Huberman, 1994). All the information gathered was analysed against theory cited in the literature review and the appropriate inferences made. Although these write-ups were simply pure descriptions of phenomena, they were central to the generation of insight.

#### **3.7.1 Validity and Reliability**

Defining the research results impact is reliant on validity and reliability concepts. Validity deals and seeks to answer the question, whether the adopted assessment or measuring process did served its intended purpose whereas the augmenting concept of reliability covers issues of whether consistent results can be achieved from repeated measurements or assessments if the same initial conditions are replicated or prevail (Chris, 2005).

In research, validity is essentially in two forms that is internal and external validity. Internal validity embraces whether study results are authentic due to the way how groups were selected, data was recorded and analysed. Variation in treating control groups or gathering of information can lead to weak internal validity. Internal validity is a concern only in causal cases. The problem arises from "inferences" in case studies and pattern-matching can be used to minimise such problems (Chris, 2005).

The external form of validity, also referred to as "generalisability", involves ascertain whether the study results are transferable to other groups for example populations or

universes (Last, 2001). High levels of internal and external validity are only possible through observing strict research processes and using proper research design. It is important to note that internal validity is a pre-requisite for external validity to be attained. The research methods used for conducting this study were designed along these critical concepts of validity and generalisability. Case study validity lies at the heart of criticism due to potential researcher subjectivity. According to Yin (1994) there can be three remedies to neutralise this problem namely the use of evidence from multiple sources, establishing a chain of evidence and letting critical research participants review the draft report. In this study the researcher used multiple sources of evidence and critical informants reviewed draft reports.

In any research the issues to do with validity and reliability are affected by bias that is inherent in the research process (Saunders et al, 2007). Such bias may emanate from researchers themselves or the research participants. Due to the fact that reliability of gathered data is important, data triangulation should be taken seriously. Consequently, triangulation in this study was performed by collaboration of data gathered from three sources which are; questionnaire, focus group discussion and semi-structured interviews. According to Seuring, (2008) qualitative research validity should be assessed using some criteria of credibility, dependability, and transferability as compared to assessments based on some objective external standard.

### **3.7.2 Ethical issues**

Consent was sought from The Wattle Company management. The interviews were consented to and participants were advised of the questions to be asked and assured of the confidentiality of information they would supply and that such information shall be used for academic purposes alone. Participants of the questionnaire were made fully aware that the study was for academic purposes and that their anonymity would be safeguarded. References are acknowledged to the best of the researcher's knowledge and any unintentional oversights will be acknowledged.

### **3.8 LIMITATIONS OF STUDY**

Listed below are some challenges that the researcher encountered in the research process: Because the research has some negative perception that is researching on failed project, respondents at first were not at liberty to express their views and associated with such but this was managed by explaining the purpose of research and confidentiality of the research findings. Information relating to the Zimbabwean dollar era was not readily available and difficult to convert to United States Dollars for comparative purposes. Due to labour turnover one of the project team members who left the company and country could not be located.

### **3.9 CHAPTER SUMMARY**

This study adopted a qualitative single case study design approach seeking to explain how organisations buy and implement information systems and what factors are important for successful implementation of ERPs. Information was gathered from project team members who were closely involved in the project and analysed using Microsoft excel. Research results' validity and reliability was ensured using triangulation of gathered data.

## **CHAPTER FOUR**

### **4.0 RESULTS AND DISCUSSION**

#### **4.1 INTRODUCTION**

In this chapter key research findings are presented analysed and discussed in line with existing literature in the research field. The results will be discussed in a quest to answering the research objectives and questions as asked in chapter 1. The chapter comprises of three major sections that is, the one that chronicles the order of events in the process pursued by the case company in selecting, purchasing and implementing ERP software; the other section analyses the key success factors for implementation such project from project team's perspectives and the last section discusses key learning points from the whole process linking the results to existing literature.

The response rate was 90%, only one programmer who had left the country could not be contacted amongst all the targeted implementation teams. This high rate improves validity of the research findings as almost all targeted agents participated in the research.

#### **4.2 HOW DO ORGANISATIONS SELECT AND PURCHASE ERP SYSTEMS?**

In purchasing the ERP system the case company went through a series of stages to arrive at a decision of which software was suitable for the business and why. The review of archival documents together with responses from interviews portray a six staged process that the organisation went through;

##### **Stage 1 Need arousal**

From the analysis of responses from the interviews it is evident that there was information gap within the organisation. Fragmented information from the legacy systems was not providing management with timely and reliable information required to run the business effectively. The legacy SMB system a UK based system had no more

support from the software provider; it was dropping off some figures causing trial balance imbalances making its financial reports very unreliable. To compound the problem was the hyperinflation era that was obtaining during the decade 1998 to 2008. The accumulation of zeros on the Zimbabwean currency caused problems for the system as it could neither cope up with the huge figures nor the IT could not get around the system so easily when there was need to cut the zeros as per RBZ directives. These deficiencies in legacy systems catapulted the need for replacing the old SMB system by a more versatile system that would bring seamless integration to business operations and information flow. This is the first stage of organisational buying process and is well put forward by (Kotler, 2002).

### Stage 2 Information search

Having realised that there was need for a new information system the case company tasked the IT manager to scout around for possible business solutions for their problems. At this stage there were only guidelines as to what the organisation was looking for and what it needed to solve by acquiring such business solutions. With the guidelines the organisation went on market and identified possible solutions that could offer solutions to its problems. This culminated in approached vendors touring the company's operations. This is an important stage in that it helps the vendors to familiarise themselves with the operations of the clients so that they can find areas where they best serve the organisation and also any workarounds and customisations that are required to better serve the organisation's needs. At this stage the vendors collected as much information as possible about the business models and field operations of the company. Laudon & Laudon,( 2009), argues that this stage is so important and requires a thorough process to exhaustively gather all available information before screening of such information begins.

### Stage 3 Presentations by software vendors

After the vendors had toured the company's operations and familiarised with the nature of business and the industry it was time for presentations on how each vendor's software would provide solutions to the problems bedeviling the company. The

company assembled a team of senior managers, IT personnel, operational team and finance users to be the audience at the vendors' presentations. The presentations afforded the vendors a chance to showcase the capabilities of their business solutions versus the requirements of the case organisation, demonstrating well they understood the client's business operations.

This was a critical stage as the ability of vendors to show understanding client business and proffering suitable and workable solutions would result in clinching the deal. If a vendor fails to demonstrate business understanding they may fail to get a deal no matter how good the system software might be (Buonanno, Faverio, Pigni, Ravarini, Sciuto, & Tagliavini, 2005). The audience were also given appraisal forms and key points to rank the software vendors' presentations and also a chance to ask questions about sticky points they may want clarified concerning their work processes. This according to (Panorama Consulting Group LLC, 2012) helps the company in choosing the software that best fits their processes.

#### Stage 4 Request for detailed quotations and selection

After the presentations were done the company compiled the list of modules and users that it required for the system and send out for detailed quotations from prospective software providers. Quotations were requested after the presentations so that the price factor could not overshadow other important factors that needed considerations for the business to get its intended solutions. SAP, (2012) list this stage as critical as the vendors lay bare the costs a situation that avoids future hidden costs in project management that may cause failures. From the presentations two contenders emerged that is ERP A and ERP B.

#### Stage 5 Software selection and considerations.

The major factors considered were summed in the statement made by the then group IT manager saying "ERP A was outstanding when looking at price, robustness, openness, functionality and speed of innovation" (nTier, 2007).

Below is a brief discussion of these factors in which ERP A system outclassed other systems which were under consideration;

## Price

After picking on the potential two software vendors a price comparison was done. ERP A being an open source based community project it was cheaper in terms of maintenance fees major costs were on software acquisition implementation and training costs. It was noted that the total cost of ownership of the system in 5years, Orion's costs were higher by USD\$250 000 which was a significant amount to the case company. TCO is an important factor to consider when purchasing information systems(Sieverding, 2008).

## Robustness

According to wikipedia.org robustness is defined as the ability of a system to resist change without adapting its initial stable configuration. The open source platform operation on Linux promised a better stable system than the windows based one at that time hence the choice of ERP A.

## Openness

System openness was appraised considering the ability of the system to interface with other systems. Since the HR and payroll modules were yet to be integrated in the software it was important to make sure that the system could be able to interface with other ready-on-the-market systems like payday so that the payroll data could be integrated into the main system. The idea of an community project open source based that was mooted was very new in the ERP industry and the system promised better interaction better than all in one integrated systems like SAP.

## Functionality

From the presentation made by the NTier vendor, the company was convinced that basic functionality of the system was in good working order. This was not well researched because there were bugs and errors of which the developers were not able to solve as evidenced by the Adempiere blog platform where errors were being posted and solutions were more of collective effort from other developers than coming from the Adempiere developers.

### Speed of innovation

In terms of speed of innovation ERP A offered just that as it was the hottest form of ERP which was supposed to be non-commercial and community based project that would be affordable in the long run to the small and medium sized organisations and even the large ones. In this regard the company sought to be innovative and lead the pack by adopting the new-on-the-market system. The need to have a choice between radical change and incremental change is important as it distinguishes the speed with which the change comes.

It is evident from the process that the organisation went through that the drivers of ES acquisition were at play as enunciated by (Palanisamy, Verville, Bernadas, & Taskin, 2010) in the literature including single vendor solution, legacy systems, ES system performance and strategy. The process of organisational buyer behaviour that goes from need recognition, information search, comparison of alternatives and finally purchasing was followed. This process that the organisation went through is in line with that published by Kotler, (2002) the new-task kind of purchase for an organisation goes through awareness, interest, evaluation, trial and adoption. These types of decisions are costly and more risky than straight rebuys and all the participants in the process ought to play their part, these participants are initiators, users, influencers, decision makers, approvers, buyers and gatekeepers(Kotler, 2002).

From the analysis of appraisal process the experience of vendor was not given due weight since the vendor had no experience at that time to tackle such a large organisation to the size of the case company. This was even evidenced by the consultant' statement that; "The Wattle project is a big deal for us. It would probably be one of the biggest ERP A implementations in Africa if not the world, and it helps nTier Software Services to move out of South Africa into other African countries. We are currently in active discussions with a Zimbabwean partner to open an office in Zimbabwe, to provide better support and actively engage that part of our market"(nTier, 2007).

The statement is a true reflection of how big the deal was for the consultant and it was not long before their marriage broke down. Whereas the vendors attributed the break to untimely payments the organisation on the other hand gotten frustrated by slow progress and what it called lack of vendor's ability to comprehend the organisation's nature of business. The statement also reflects the need for the vendor to grow into other markets as it was predominantly domiciled in South Africa. The consultant's location was going to be more expensive for the case organisation in the long run in terms of support if there was to be needed to have technicians on site.

### 4.3 FACTORS THAT UNDERLINE SUCCESSFUL ERP IMPLEMENTATIONS

In answering the question on key factors that lead to successful ERP implementation project team members were asked to rate identified twenty eight factors on a 5 point scale from 1=strongly disagree, 2= disagree, 3=neutral, 4=agree and 5=strongly agree. The ten highly regarded factors from the questionnaire and interviews are discussed below;

#### 4.3.1 Top management commitment and support

Everyone from the project team agreed that top management commitment and support to the project is critical for successful implementation of ERP projects. It was noted that after making the purchasing decision top management from head office took a back seat in the project until there were traces of project delays and budget overruns which then prompted a more involved approach to the implementation process. During the relaxed period the project was being run by mainly finance and IT given that the Information Technology Manager was the project champion. Figure 4.1 shows a graphical presentation of the responses about whether top management commitment and support was important in successful ERP implementation.

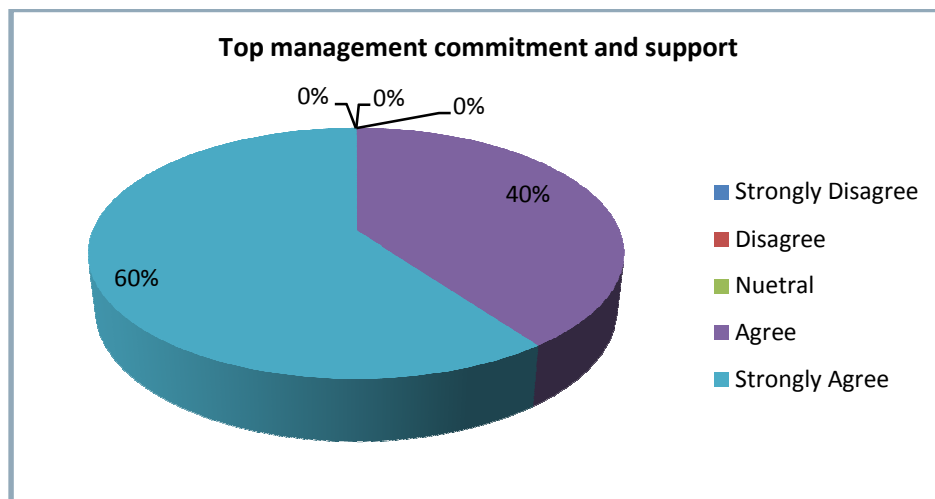
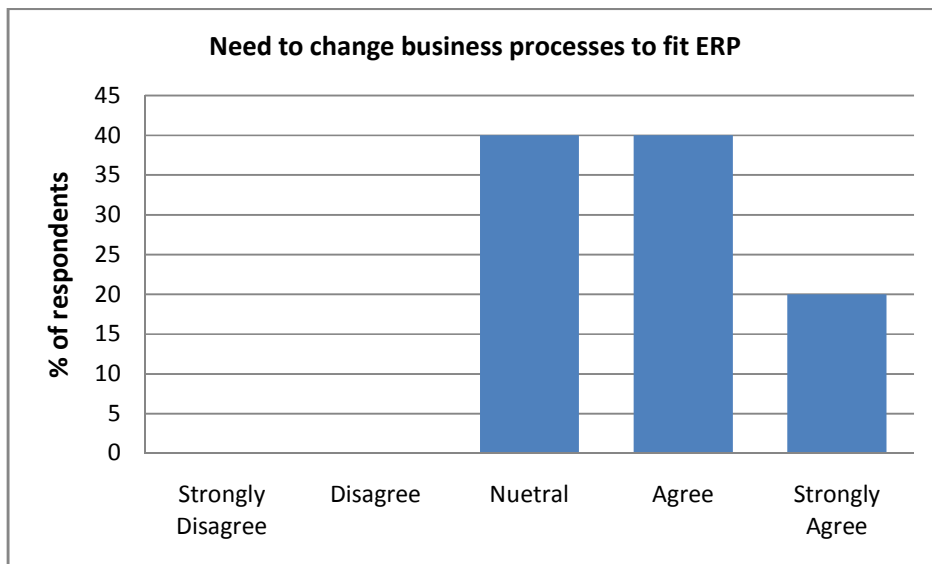


Figure 4.1 Importance of top management commitment and support

All respondents agreed but most importantly 60% strongly agreed with the notion putting the issue on the fore of critical factors to underlie successful implementation. These results are not in line with (Maguire & Udechukwu, 2010) whose research trivialise top management commitment but the result supports the work of Al-Mashari & Al-Mudimigh, (2003) and Akkermans & Van Helden, (2002).

### 4.3.2 Need to change business processes to fit ERP

Respondents were asked to express their degree of agreement to whether the need for organisation to alter business processes to fit ERPs and minimise customisations was fundamental to successful implementations. The chart bellows shows the responses summary;

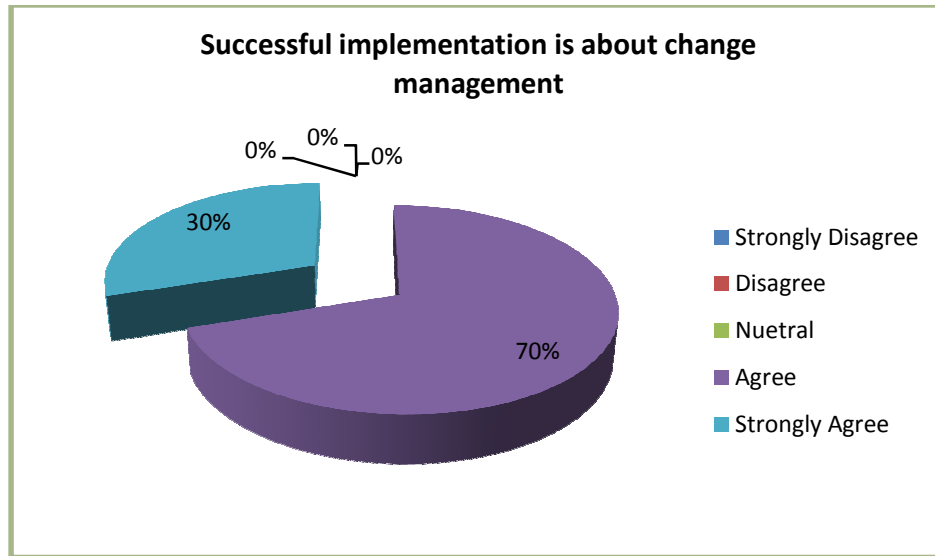


**Figure 4.2** Importance of the need to change business processes to fit ERP

From Figure 4.2 it is evident that the 60% of the project team members agree to the need to do a business process reengineering so that customisations are minimised. BPR has been fingered in a number of studies as key to successful ERP implementation Koh, et al, (2006) and Muscatello et al, (2003). From the focus group discussion it was evident that some members did not quite comprehend the concept of BPR hence those who when neutral on the question.

### 4.3.3 Successful implementation is about change management

Change management has been identified as a critical success factor for successful implementation of ERP projects(Akkermans & Van Helden, 2002). Figure 4.3 presents the views of the project team members with regards to the importance of change management to successful implementation of ERP systems.

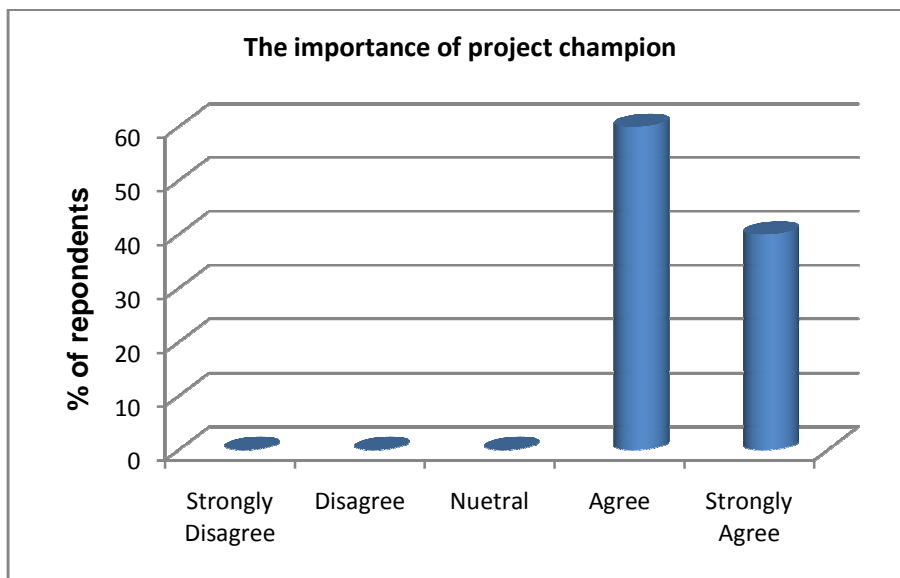


**Figure 4.3** Successful ERP implementation is about change management

All respondents agreed to the fact that successful implementation requires the organisations to change the way jobs are done so that employees embrace the new way of doing things embedded in ERP system. Change management has been identified as a major stumbling block that slowed down adoption and acceptance of ERP system by users at the case company. Users were so engrossed in the old way of doing business and were comfortably using the old system since the parallel system change-over was chosen to the extent that the old system had to be banned so that everyone uses the new system in a direct cut over kind of change. A. Momoh, (2010) and Aloini, et al, (2007) noted that, it is important that organisations tackle change management successfully for them to implement ERP successfully. According to Panorama Consulting Group LLC,( 2012), about 63% of organisations surveyed that implemented ERP system, struggle with change management process making it a vital factor in ERP implementations.

#### 4.3.4 Project champion's importance

Project leader is the one who drives the ERP implementation process hence the post is an important one (Al-Mashari & Al-Mudimigh, 2003). If project champion is not professionally filled that is with capable skilled manpower it can lead to project failure (Dey, Clegg, & Bennett, 2010). Figure 4.4 shows the responses from the project team members about how they value the importance of project champion in relation to project success.



**Figure 4.4** Importance of project champion

Figure 4.4 shows that every project team member agreed that the project champion is important for successful implementation. This involves the champion having open channels of communication to the highest levels in the organisation and also being senior enough to make significant decisions so that implementation progress is not hampered. This was mainly evidenced when the project champion left the company during the implementation process throwing the project into disarray. The managing director later adopted the role of project champion after stagnation resultant from resignation of the project champion from the case company. The project champion had the required skills and was senior enough to steer the project. If project champion is not

allowed to make significant decisions about the projects then the project is likely to fail(Kim, Lee, & Gosain, 2005).

#### 4.3.5 The need for clear goals and objectives for successful implementation

Without direction, embarking on any project is guaranteed to fail(Somers & Nelson, 2004). Objectives help stir the project to its destination bringing in the desired benefits. The existence of clear goals enables those in decision making so that decisions to be made during the implementation period are aligned to the broader objectives of the organisation. Figure 4.5 depicts how respondents rated the importance of clear goals and objectives in relation to project success.

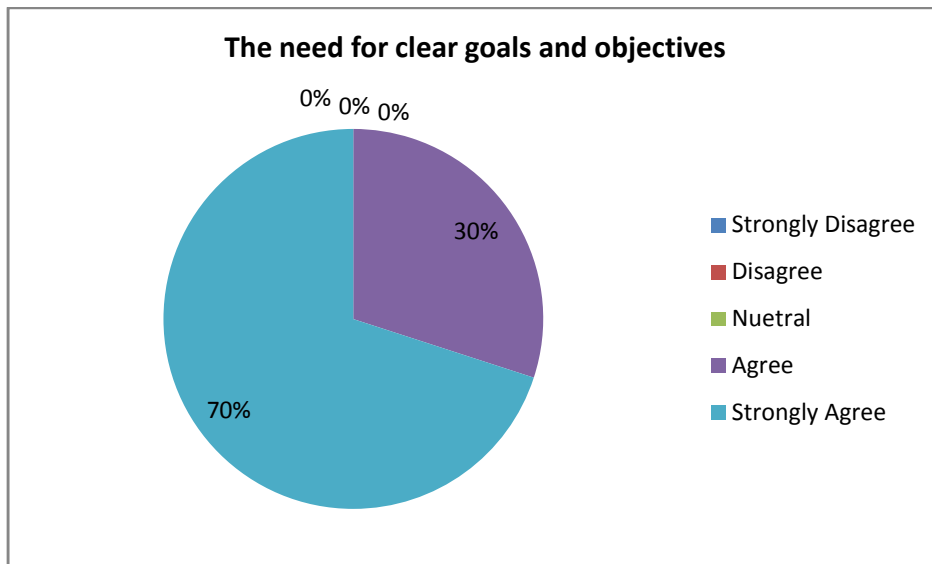


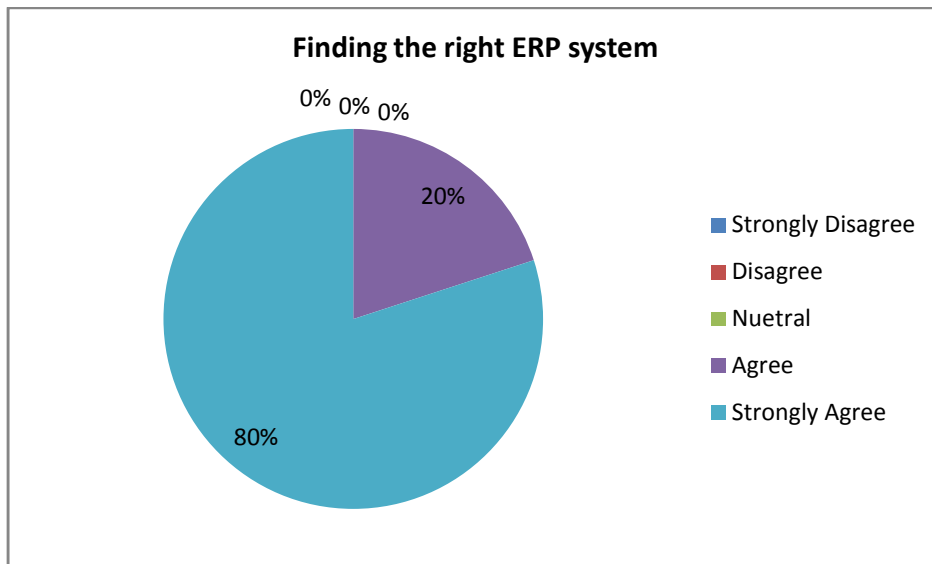
Figure 4.5 The importance of clear goals and objectives

All respondents agreed that clear goals are essential for ERP project success with 70 % strongly agreeing to the notion. The company was so clear on the goals it needed to achieve in terms of overcoming its then current challenges to do with legacy systems. One of the objectives sections that were not tackled well was to do with return on investment (ROI). Information technology projects are difficult to have their benefits quantified (Panorama Consulting Group LLC, 2012) but the company should have made an attempt to calculate so that there would be clear guidance to the implementation

process. In related studies (Mehrerjedi, 2010) found out that managers in successful ERP implementations had clearer work on planning.

#### 4.3.6 Finding the right ERP system is important to successful implementation

Settling for the right ERP package has been identified as a major leap towards ERP implementation success (Buonanno, Faverio, Pigni, Ravarini, Sciuto, & Tagliavini, 2005). This is because the right ERP package reduces misfit between ERP processes and business processes thereby reducing customisations to be performed to the system (Mehrerjedi, 2010). Figure 4.6 shows how respondents rated the importance of getting the right ERP in relation to ERP success.



**Figure 4.6** The significance of selecting the right ERP package

The process of finding strategic fit between enterprise .system and the organisation that culminates in choosing the right system for the organisation proved to be an important one with 80% of respondents strongly agreeing to its notion. All the respondents agreed that it is of paramount importance to choose the right ERP system and their majority think that the organisation did choose well in settling for Adempiere ERP system. All respondents are in agreement with regards to the importance of selecting the right ERP Software. If correctly selected there will be good match between the organisational

goals and the software offering as well as solving the problems that would be bedevilling organisations hence there was potential to realise potential gains in a short space of time(Akkermans & Van Helden, 2002). The ERP A system that was chosen did not closely fit the business processes but was chosen mainly on its envisaged easiness to be customised so that the company would minimally disturb the way it conducted business.

#### 4.3.7 Consideration of current legacy systems

It has been long identified that legacy systems form the base upon which ERP systems are then focussed(Panorama Consulting Group LLC, 2012). It is important to such an extent that 72% of surveyed clients adopt ERP focused on legacy systems and core functionalities of such systems. Legacy systems are a real force especially when considering data migration from legacy systems to the new ERP(Soja & Paliwoda-Pekosz, 2009). Figure 4.7 shows how respondents rated the importance of considering legacy systems in ERP implementation success.

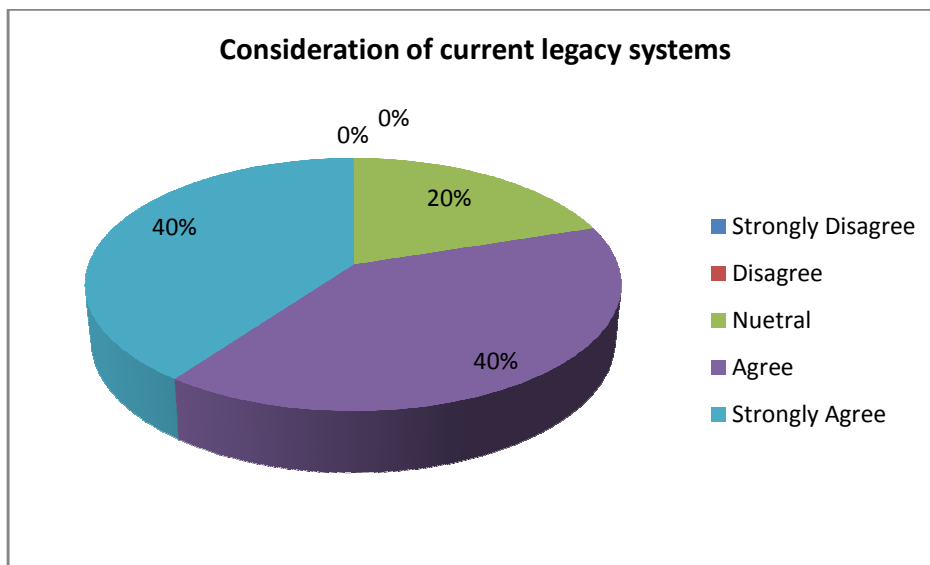


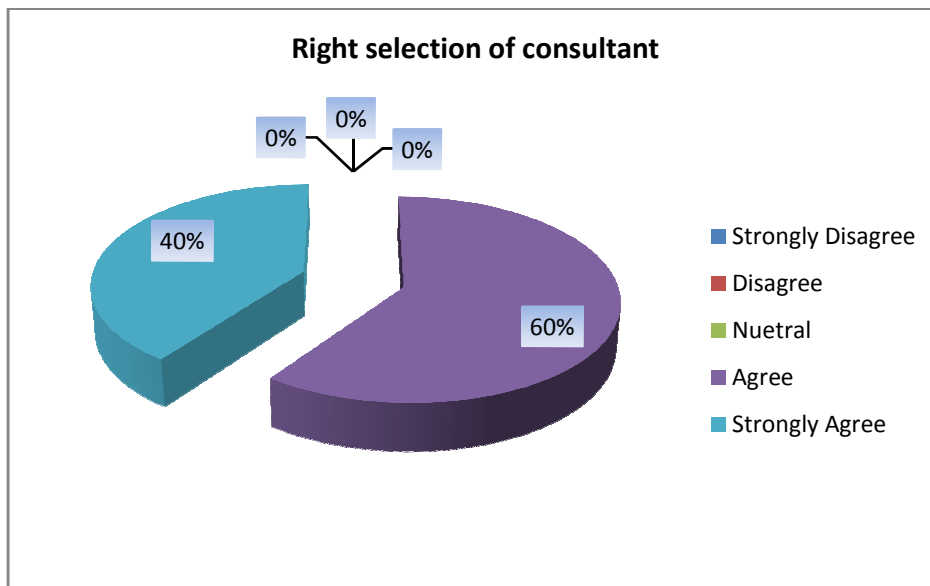
Figure 4.7 Should current legacy systems be considered?

Eighty percent of the respondents agreed that due consideration should be given to current legacy system problems so that proper solutions are modelled to make sure that

those problem do not recur themselves in the new system. This provides a good platform for business process reengineering is some problems are as a result of how business is conducted(AI-Mashari, Al-Mudimigh, & Zairi, 2003). Twenty percent who were neutral on this question explains that if great focus is devoted to current legacy system that may impede or limit how far the organisation can go in looking for business solution however legacy systems are a good starting point. From the interviews it was evident that the case company gave too much attention to the legacy system to the extent of just trying to replicate the old system in the new ERP package through customisations.

#### 4.3.8 Right selection of ERP consultant

From existing literature, it is important for an organisation to make the right selection of consultant as these consultants facilitates knowledge transfer to the organisation's employees(Chan, Walker, & Mills, 2009). Figure 4.8 depicts how respondents rated the importance of right selection of consultant.

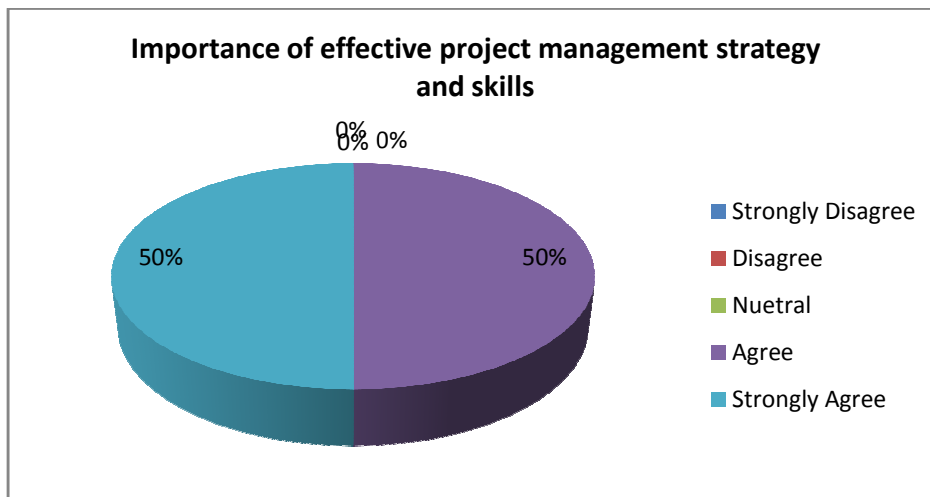


**Figure 4.8** The significance of selecting the right ERP consultant

It was generally agreed that selecting the right consultant for effective knowledge transfer was vital for successful ERP implementation. Consultant lack of experience and proper knowledge of ERP A system was highlighted as a cause for breakdown in the relationship between the case company and the consultant. It was clear that the consultant was hiring university graduates locally to do the programming on a contract basis casting the doubt that they lacked the experience and giving hope to the company that they could successfully go it alone. Consultant support and knowledge transfer facilitates fusion of techniques to the organisational users and helps in boosting acceptance and use of the new system(Soja & Paliwoda-Pekosz, 2009);(Maguire & Udechukwu, 2010). The case company assumed the risk but as time went on it was evident that in-house development required specialised skills and expertise that was largely not available.

#### 4.3.9 Effective project management strategy and skills

Project management skills have been identified as a CSF(A. Momoh, 2010). Even though ERP projects are viewed to be more than other IT projects the use of project management tools like critical path analysis, team building and teamwork, the use of dashboard still play a pivotal role in steering the project to success Dey et al, (2009). Figure 4.9 depicts how respondents rated the importance of project management strategy and skills to successful ERP implementation.



**Figure 4.9** Importance of effective project management strategy and skills

ERP systems are huge projects and the availability of skill and strategy of managing such projects needs to be well placed if success is to be guaranteed. Diverse project management and tracking skills need to be employed simultaneously and consistently throughout the implementation phase. Project dash boards need to be in place scheduled meetings and set milestones need to be used so that red flags are raised once there is indication of failure to be on course of the project track. According to Somers & Nelson(2001) project management skills are fundamental to successful implementation of ERP projects. The project strategy for the company was in place but lack of timely funding threw the project into disarray. The company used critical path analysis and project milestones and dashboards to monitor project progress.

#### 4.3.10 User training

User training entails imparting knowledge to the users of the system from the company and consultant. Training has been identified as a catalyst that reduces resistance to change and also stirring positive attitudes in employees as they embrace change Chan et al, (2009). Figure 4.10 shows hoe user training was rated as a CSF for ERP implementation.

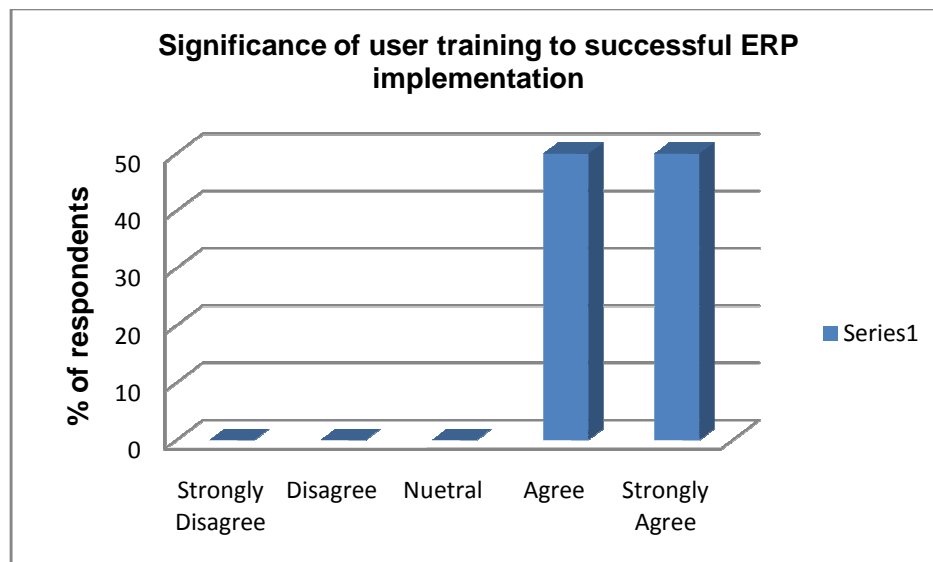


Figure 4.10 The importance of user training

User training has been long identified as a source of knowledge transfer from the consultant to the system users in the organisation. Training helps change users mind-set especially if they are not conversant with the new system that can create a lot of resistance that usually causes the new system to fail. User training helps in effective knowledge management which can simplify the change management process for successful implementation of ERP projects(Nonaka & Takeuchi, 1995). User training was conducted well in the case company but labour turnover quickly eroded the asset as those who remained were mainly composed of those trained internally by others.

#### **4.4 KEY LEARNING POINTS FROM THE IMPLEMENTATION EXPERIENCE**

Throughout the research work there are a number of issues that have been brought to the fore as key areas that need attention where the organisation should pick up lessons and move on and these include;

##### **4.4.1 Customisations**

System customisations are costly and time consuming, thus the majority of senior managers' views are now skewed towards vanilla implementations. Customisations must be minimised and limited to areas of competitive advantage only. It was evident from the implementation and the level of customisation done which the Business System Manager estimates to be at 75% that the company tried to replicate more or less the processes that used to be done in the old legacy system. According to Davis, (2005) system customisations must be limited to areas of organisational competitive advantage and where there are no alternative ways of doing the process as these customisations may impact negatively on system functionality and agility. From Panorama consulting 2012 ERP report the level of 75% constitutes extremely customised level hence its impact on successful implementation of ERP is profound.

#### **4.4.2 Going for novel products**

There is a feeling that there is no need to reinvent the wheel, it is important to take note of what others are doing in the industry and those tried and tested systems should be easy to adopt and implement and are likely to bring benefits in the shortest possible timeframe. There are bigger and well managed forestry companies in the greater world including in Brazil New Zealand, America and it was felt that the company could be a leader in the local industry by adopting those systems that have been proven to work well in the industry. Due to the high level of ERP failures and costs involved small to medium sized companies unlike their large counterparts are not likely to weather well the failure path and hence costly uncertain ventures should be avoided in future(Al-Mashari, Al-Mudimigh, & Zairi, 2003). When the Adempiere software was chosen in 2006 it was the year the product was offered on the market not as an improved product but in its very first initial status. Some respondents expressed that the company should have gone for tried and tested software especially when the vendor struggled to clear some bugs.

#### **4.4.4 Vendor selection**

When selecting a vendor, it is very important that proper appraisal is done including the success and nature of past jobs done in relation to the task at hand. After the relationship broke down between vendor and client, a search of the previous customers prove that the implementations that were done by the vendor were relatively small compared to the size of operations of the case company. Although there was no choice for the case company because the vendor was the only accredited dealer of the software in Africa it is necessary to have software whose support is readily available. Vendor selection should be done in a manner such that the best vendor is selected as there are serious consequences if the chosen vendor's capacity is limited hence failing to deal with organisation's requirements(Ponis, Tatsiopoulos, Tsitsiriggos, & Christou, 2007).

#### **4.4.5 Funding**

Without adequate funding implementation of ERP systems are more likely to fail (Dey, Clegg, & Bennett, 2010). ERP systems are costly and as such organisations should be prepared to spend money on the project to make it successful. There were times where the case company failed to honour its obligation to the vendor on time hence delaying the progress on the implementation. When the case company decided to go it alone, it had one developer at a time an issue that militated against the rate of progress and the turnover of these programmers was attributed to failure to retain the talent. In the period of the 5 years the company has had three programmers. The funding for V-sat technology upgrade remained unfunded and the links to remote sites are very slow.

#### **4.4.6 Project staff turnover**

It is pretty important that project staff welfare is well taken care of so that exodus of project staff is avoided for the sake of the project to stay on track. The rate of project staff turnover has been regarded as high. By the end of the 5 year period the company had lost project champion, two programmers, 2 committee members and other key players like the managing director and general manager finance who were instrumental in supporting the cause of the ERP project. By the end of the five year period the team was fragmented and full of members who would question the rationale of selecting the system in the first place making it very difficult to have a coherent project team that can drive the project forward. The turnover factor became very important as there is need for shared vision and goals for better teamwork. According to (Wickramasinghe & Gunawardena, 2010) project team coherence and team management is a critical factors that discriminate successful and unsuccessful organisation in ERP implementations.

#### **4.4.7 In-house software development requires highly skilled programmers and teamwork**

Settling for in-house software development demands highly skilled developers and there is need to have a pool of them so that succession is guaranteed when one leaves employment(Koh, Simpson, Padmore, Dimitriadis, & Misopoulos, 2006). The company adopted a one programmer per time and this proved so ineffective as the programmers would be overloaded by work and fails to do all the administration work that is compiling the codes and documentation. The lack of documentation proved futile when programmers left the company and a new one has to pick up the pieces this reduced progress immensely as time would be spend trying to understand undocumented codes and no proper induction would be possible. It was so evident that in-house development requires a pool of programmers who understudy each other so that there is continuity in case the lead programmer leaves employment.According to (Panorama Consulting Group LLC, 2012) software development requires expert help in that the development has to continuously meet government and tax laws. Software development is best done by consulting service providers who understands well the client business(AI-Mashari & AI-Mudimigh, 2003).

#### **4.5 CHAPTER SUMMARY**

This chapter concentrated on reporting the research findings and discussing them, their implications and link to existing literature. The following chapter focuses on the conclusions made through the research, recommendations and possible areas for further research in the ERP field.

## **CHAPTER FIVE**

### **5.0 CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 INTRODUCTION**

In this chapter the researcher infers and draws conclusions of the research using information acquired from the findings as discussed in chapter four. This section will reflect the extent to which this research achieved its objectives setting also limitations of the project. The last section of the chapter will proffer recommendations to management together with their evaluation and suggestions for areas of further study.

#### **5.2 CONCLUSIONS**

##### **5.2.1 How organisations select and adopt ERP system**

The purchasing of ERP systems follow more or less the same process that organisations go through when they purchase other new task kind of products except that ERP systems have far reaching implications hence vigorous information search, more collective participation in appraisal and decision making is practised.

##### **5.2.2 Critical elements that underlie successful ERP implementation**

It is evident from the findings of the study that ERP systems are large complex systems that requires concerted effort for their implementation to be a resounding success. Among other host of factors, top management commitment and support, BPR, need for clear vision and objectives, change management, selection of right ERP package, selecting the right software vendor, effective project management skills, project team leader, consideration to legacy systems and user training emerged highly ranked. Companies should give the above factors due attention as they distinguish between failure and successful ERP implementations.

### **5.2.3 Project funding**

Funding is an important factor in ensuring that the project attains its set milestones. Third parties to the ERP implementation process should also be paid on time to avoid supplies delays.

### **5.2.4 Project staff turnover**

Project staff turnover negatively impact the progress of ERP implementation progress. Project staff turnover need to be monitored closely in order to retain required talent and ensure proper continuous knowledge transfer.

### **5.2.5 New products on the ERP Market**

There are new products on the ERP market hence organisations need not to limit themselves to old way of doing business. There is need to explore these available new products. The software as a service (SaaS) and best of breed ERP packages are more suitable for small to medium enterprises and companies need to explore these solutions.

## **5.3 RECOMMENDATIONS**

In light of the research work done the researcher recommends the following to company management and to would be ERP adopters;

### **5.3.1 ERP package selection and vendor selection process**

Information search should be given more attention so that selected ERP package closely fit organisational processes such that system customisations are minimised. The vendor consultant to win the tender should be thoroughly appraised including their capacity to handle company projects versus their previous experiences and capacity.

### **5.3.2 Project funding and nature of ERP package**

ERP projects generally cost more than budgeted for and as such there is need to have adequate financial resources before embarking on a project of such magnitude to avoid costly delays in funding requirements and project time overruns. Novel and innovative products are more costly and when adopting such, the company should be strong financially and be prepared to fail more than adopting a well tried and tested packages. The company should opt for tried and tested ERP packages.

### **5.3.3 Project staff turnover**

ERP projects are huge and they take considerable amount of time to fully implement. Project staff turnover should be minimised so that members that share the same goals and objectives steer the project to completion.

### **5.3.4 ERP projects scope**

ERP projects affect the way organisations do business and as such they are more than just any other IT projects hence top management should unequivocally demonstrate their commitment and support for the projects to be successful. There is need for total buy-in by everyone involved to ensure good smooth transition.

### **5.3.5 New business model**

With the advent of cloud computing there are opportunities that the organisation can tap into by going for the-best-of breed ERP solutions where implementation risk and cost are low boosting chances of success. These best of breed ERP solutions are based on the software as a service concept where the client pay for its usage only and does not have to invest heavily like in on-premise ERP systems. Using the services of IT consultants in assessing the needs of the company and the best package can also help secure success as enthusiasm that is found in company employees is dealt away with and decisions are made rationally

## **5.4 EVALUATION OF RECOMMENDATIONS**

Strategies and recommendations should be well placed and this section appraises provided recommendations to the case company for suitability, feasibility and acceptability. Suitability entails assessing whether the strategy serves or addresses the mission, feasibility looks at how workable the solution is in relation to the organisation strengths and weaknesses and acceptability relates to whether stakeholders in the organisation will accept the strategy as a workable solution going forward (Johnson, Scholes, & Whittington, 2008)

### **Recommendation 5.3.1**

From the existing literature and studies it is clear that a system that closely fit with the organisation's operations guarantees successful ERP implementations hence the strategy of finding a system that fit the operations will serve the purpose of the company of having an operational ERP system. The strategy is very feasible as the company possess required skill to perform the matching exercise moreover the process does not chew much financial resources. Acceptability of the strategy is critical and in this case the recommendation is acceptable as key stakeholders are on record questioning the basis for choosing the previous ERP package. The recommended process will help key stakeholders' acceptance since they will also be highly involved in the process.

### **Recommendation 5.3.2**

Tried and tested ERP packages will provide the organisation with total integration and provision of timely information for informed decision making thus being suitable for the organisation at the moment. In terms of feasibility, off-the-shelf tried and tested packages are easy to cost and anticipate total cost to company of such projects unlike novel products which may have more unplanned costs in future after their adoption. Even though the organisation is facing cash flow challenges, with the turnaround strategies being pursued the researcher is optimistic that the organisation will be able to fund a new ERP system.

With the memory of a failed ERP project still being vivid, in accepting the failure and mandating the search for a new system the directors hinted that there is no need for the company to try and re-invent the wheel meaning that the company should also look at systems being used in the same industry. The directors' sentiments show that acceptance of a well tried and tested ERP is likely to be easy hence the recommendation is acceptable.

#### **Recommendations 5.3.3 -4**

Taking care of the required changes and making sure that the project team stays intact during the implementation process will ensure successful ERP implementation that the company is looking for thus the recommendations serves the purpose. The organisation is capable of retaining project staff and carrying out the required change activities needed hence the recommendation is feasible. Once the organisation has settled for an ERP package these recommendations automatically become accepted as they spell the way forward in successful ERP implementations.

#### **Recommendation 5.3.5**

Most of the off-the-shelf ERP packages do not squarely fit organisational requirements and that they do not offer equal or the best strengths in all functional areas of business, the best-of-breed solutions are bridging that gap giving organisations flexibility. The cloud based computing software packages are also being priced lowly whereby the company does not own the system but has access and use thus paying as per rate of usage. This recommendation is suitable for a medium sized organisation given high initial outlay for securing on premise ERP solution.

In terms of feasibility there are current infrastructural limitations which the researcher feels will be a thing of the past in the near future. Cloud based systems required high speed internet connectivity and the company has a fibre link at its head office but its remote sites are connected through an out-dated V-sat system. The V-sat system can

be upgraded at reasonable cost thus making the dream of high speed internet connectivity a reality. The supply chain for the organisation also poses some challenges to total adoption of cloud based systems as they require integration of the supply chain system. With minimal network and business partners' upgrades the recommendation becomes feasible. Given that the failed ERP is still in use the company can hold on to it a little longer and the internet infrastructure would be sorted. Being yet a novel product on the market the best-of-breed package is likely to face some challenges in acceptability but with proper cost benefit appraisals key stakeholders should be able to accept the proposal.

## **5.5 AREAS FOR FURTHER RESEARCH**

The researcher feels that ERP systems are here to stay and their post implementation evaluation and usage vis-à-vis their envisaged return on investments and organisational stability after their adoption is an area worthy further exploring in research.

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## **Appendices**

### **Questionnaire**

**“This research instrument is for a case study on how organisations select ERP systems and identification of the critical success factors for the successful ERP implementation”**

Questionnaire No.\_\_\_\_

Dear Colleagues,

You are being invited to participate in this research project to review and identify what the critical success factors that may results in the successful ERP implementation at The Wattle Company Ltd are. The project is a key part of Masters of Business Administration dissertation under the guidance of University of Zimbabwe. This questionnaire consists of thirty one questions that deal with identification of Critical Success Factors (CSFs) for the successful ERP implementation at a Small to Medium Size Enterprises.

Based on this project I want to understand the factors that underlie successful ERP project implementation.

I have attached a short questionnaire about CSFs for ERP implementations; the questionnaire is brief and will take about fifteen minutes to fill in. Pointers for completing the questionnaire are on the form itself. All questionnaires are numbered to help keep track of their returns.

I promise that your privacy will be respected. Your valuable time and candour will be highly treasured. Please be assured that all information you provide will be used for academic research only and your name or other identifying information will not appear on any part of the study report. All the individual responses will be kept confidential.

If you have any questions concerning this study, please do not hesitate to contact me at johnjonga@gmail.com. I hope you will view this as an important matter.

Thanking you in advance for your time and effort in completing the questionnaire. Your effort is greatly appreciated.

Yours Sincerely

John Jonga

**General Information**

Name	Click here to enter text.	Gender	Choose an item.
Organisation	The Wattle company	Position	Click here to enter text.
Position in Project team	Click here to enter text.	When (Time frame)	Click here to enter text.
Level of education	Choose an item.	Age range	Choose an item.
Date	Click here to enter a date.	Did u have previous experience in implementing new systems?	Choose an item.
If yes state where and when?	Click here to enter text.		

**While Filling This Questionnaire Please bear in mind the following;**

Country; Zimbabwean environment only

Industry; Medium Size Enterprise in the Forestry and Agro-processing

Domain; All (Finance, Procurement, Marketing, HR, Production and Forestry)

ERP Vendor Compiere Adempiere

**CSFs:** Critical Success Factors are defined as the key aspects or areas where “things must go right” to facilitate high levels of success in ERP implementation process.

**A:** In part A please do select the box which best represents your opinion (Select only One Box for each Question).

**B:** In part B please identify the Critical Success Factors (from question one to twenty eight) that are critical throughout for all ERP implementation phases (planning, implementation, stabilisation, and improvement) at SMEs.

Questionnaire I (Conti...)

**(A and B) Identification of Critical Success Factors (CSFs)**

According to the relevant literature review there are Critical Success Factors (CSFs) that determine success of ERP implementation in organisations, those are not only internal and enterprise specific but also external. The ability to identify and understanding of these factors from the ERP project team members' point of view may help in successful ERP implementation in Zimbabwe as it may help in minimising the risk of ERP project failure.

Please do select the box which best represents your opinion (Select only One Box for each Question). Your point of view will be kept confidential and will be used for academic research only.

(A). Please read the following statements and check (x) by clicking in appropriate box to express your degree of agreement or disagreement regarding your views about Critical Success Factors (CSFs) for the successful ERP implementation.	YES	NO
Does different size of enterprise influence success of ERP implementation?	<input type="checkbox"/>	<input type="checkbox"/>
Does selection of ERP vendor/ERP products influence success of ERP implementation?	<input type="checkbox"/>	<input type="checkbox"/>
Does employee of the enterprise influence success of ERP implementation?	<input type="checkbox"/>	<input type="checkbox"/>

Please select the number in the box which best represents your opinion for the Critical Success Factors (CSFs) which determine ERP implementation success on a scale of 1 to 5. (Please Select only One Box for each Question).

**1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree**

(B). Please read the following statements and check (x) by clicking in appropriate box to express your degree of agreement or disagreement regarding your views regarding the identified CSFs.	Scale				
1. Top management commitment and support is necessary for the successful ERP implementation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
2. ERP adopting enterprises should be willing to alter their businesses process to fit those of ERP software so that customisations needed for the successful ERP implementation are minimised.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
3. Successful ERP implementation demands the way firms do business will need to change as well as the ways people do their jobs.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
4. Project Champion (Project Leader) is one of the most important factors for the successful ERP implementation.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

5. Clear goals and objectives are critical in guiding organisation's efforts for the successful ERP implementation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
6. The provision of an effective communication platform and communication itself across all organisational functions is important for successful ERP implementation.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
7. Post evaluation of ERP system for continued feedback and improvements is important for successful implementation process.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
8. Proper risk management practises involving anticipation of uncertain events and their likely impact on project and devising risk mitigation strategies improves ERP project success.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
9. Active monitoring of ERP implementation process using set targets and agreed mile stones is important for implementing ERP projects successfully.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
10. Shared goals and trust between interested stakeholders in the project is a good corporate culture that enhances successful project implementation.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
11. Implementation cost has a major bearing on ERP project implementation success.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
12. Software development, testing and troubleshooting are important activities for implementing ERP successfully.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
13. Preparedness of the company in terms of IT resources, availability of required skills and architecture results in ERP implementation success	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
14. Selecting the right ERP package is an important step for succeeding in ERP implementation projects.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
15. Obtaining high data accuracy and integrity during data migration is crucial in achieving ERP implementation process success.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
16. Due consideration must be given to legacy systems as they are good pointers of the form and magnitude of likely problems in the new system if the new system is to be implemented successfully.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
17. The organisation's commitment to implementing off-the-shelf vanilla system help in the success of ERP implementation process.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
18. A balanced cross-functional implementation team is	1	2	3	4	5

important for achieving success in implementing ERP projects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Implementation success is affected by adopted implementation strategy and timeline.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
20. Selecting the right ERP consultant for proper knowledge transmission from consultant (vendor) to client helps in the success of ERP project implementation.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
21. Good working relationship between client organisation and the software vendor leads to successful ERP implementation.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
22. Effective project management strategies need to be employed to achieve success in ERP implementation process.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
23. ERP adopting companies should keep all their interested stakeholders appraised about the project to avoid misconceptions and succeed in ERP projects.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
24. Users' involvement in the whole process makes ERP implementation process a success.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
25. Successful ERP implementation process depends on proper users' training and education	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
26. The ERP adopting enterprise should possess relevant skills, motivation and creativity skills required to achieve the originality to boost successful ERP implementation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
27. Successful ERP implementation depends on positive attitudes and morale of the employees towards the ERP adoption.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
28. It is needed that ERP implementation team to be authorised to make essential decisions in due time for the successful ERP implementation.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Please do list any other critical success factors which are missing in above questionnaire but that may contribute in successful ERP implementation.

[Click here to enter text.](#)

***Thank you for your Cooperation!***

I sincerely thank you for your valuable time and very useful information which will help me dearly in MBA dissertation. I assure you complete confidentiality of the information given by you.

Sincerely,  
John Jonga

Research Scholar,  
Masters of Business Administration  
Graduate School of Management, University of Zimbabwe

### **Semi structured and Focus Group discussion guiding theme questions**

1. What is your experience with ERP systems implementation at Wattle Company?
2. What were the challenges the organization faced in implementing the ERP system?
3. What is your view regarding customising ERP systems?
4. Are there any points that the organization can learn from the experience?