

**AN EXPLORATION OF ORACLE ENTERPRISE RESOURCE PLANNING
USAGE ON WORKER PRODUCTIVITY AT THE RESERVE BANK OF
MALAWI.**

**MASTER OF ARTS (HUMAN RESOURCE MANAGEMENT &
INDUSTRIAL RELATIONS) THESIS**

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UNIVERSITY OF MALAWI

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Submitted to the department of Political and Administrative Studies, Faculty of
Social Science in partial fulfilment of the requirements for the award of the
Master of Arts degree (Human Resource Management & Industrial Relations)

University of Malawi

MARCH 2021

DECLARATION

I, the undersigned, declare that this research project is my original work and has not been submitted to any university for any award.

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Signature

Date

CERTIFICATE OF APPROVAL

This project has been presented for examination with my approval as the appointed supervisor.

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SUPERVISOR

DEDICATION

I dedicate this dissertation to my family without whose support I would not have made it this far. May God Almighty bless them.

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ABSTRACT

This thesis explores the productivity of workers as related to the use of Oracle Enterprise Resources Planning Systems at the Reserve Bank of Malawi. This study topic was influenced after considering that the bank had made considerable investment in ERP systems with the overall aim of improving productivity inclusive the worker productivity. A mixed method of research was used for the study and data was collected from archival records and from a purposively selected sample of 50 participants. The study adopted the conceptual model from Leavitt (1965) model of an organisation to establish links between technology adoption in form of ERP and worker productivity. The study found that changes in technology induces positive changes in productivity of workers at the bank. That is the conclusion of this research indicates that Oracle ERP has a direct influence on the productivity of individual workers at the Reserve Bank of Malawi. From the findings of the study, it is evident that usage of Oracle ERP enhances the productivity of workers through informational elements, improved task completion and decision making. The study further recommends continuous training on the part of workers at the bank in order to optimise usage of ERP systems, and thereby maximisation of their potential benefits.

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ABBREVIATIONS AND ACRONYMS

ICT	Information and Communication Technology
IT	Information Technology
MRP	Material Requirements Planning
OERP	Oracle Enterprise Resource Planning
RBM	Reserve Bank of Malawi
BPR	Business Process Reengineering
SPPS	Statistical Package for Social Science

CHAPTER ONE

INTRODUCTION

The purpose of this chapter is to introduce the topic of this research. The chapter begins by highlighting the background to the use of ICT in the form of Oracle ERP. This is followed by a discussion of the problem on impact of ERP on worker productivity in ICT literature. The aim of the research will be outlined by a description of the research objectives, and the discussion of the significance of the research. Lastly, a presentation of the outline of the thesis concludes the chapter.

1.1 Background

The modern global and competitive business environment has presented many challenges to organizations central to which has been productivity improvement. Productivity enhancement is a major preoccupation of many organizations, and this has come largely from the realization that the business environment is ever increasingly changing and hence inducing changes in both organization structures and processes. This is in line with Sobhani (2008) who postulated that productivity improvement is fundamental to the survival of companies, not only because of increasing competition, but also because of a rapidly changing environment. That is to compete and function effectively in today's environment, many organizations have tended to adopt the strategy of continuous productivity improvement. Organization productivity is understood as encompassing many aspects one of which is worker productivity.

Worker productivity is one of the most important management topics that have received significant research attention from several scholars and is considered the primary mechanism of enhancing organization productivity (Hanaysha, 2015). For any organization, knowing what the key factors that influence productivity are, is vital in ensuring long term performance, worker productivity is one such factor (Hanaysha, 2015). Worker productivity can be described as a measure of the ratio between how much a person's knowledge and skills, along with effort and tools, influence the results of the work performed (Cresnar & Nedelko, 2017). It is therefore not strange to note that worker productivity improvement has of late become one of the most important objectives for many organisations. This is the case because higher levels of worker productivity have been touted as beneficial to both organizations and workers in a number of ways. For example, organisation productivity benefits include: favourable economic growth, large profitability, and better social progress (Sharma & Sharma, 2014). Additionally, worker related benefits of increased productivity include better wages/salaries, better working conditions, and favorable employment opportunities. Therefore, all these benefits have made worker productivity a subject of great of attention.

The quest for improved organisation productivity has among other things, seen organisations becoming ever increasingly reliant on information and communication technology (ICT) for productivity improvement through flexibility support in processes and organizing mechanisms, and for facilitation of innovation and responsiveness (Pekkanen, 2012). This has been facilitated by the exponential growth and advancement in information technology (IT) which is a significant factor that is greatly influencing today's business environment (Khattab et al, 2012). It is therefore not surprising to note

that some organisations have turned to information communication technologies (ICT) like Enterprise Resource Planning System (ERP) in search of improved productivity. This position is augured by the study of Brynjolfsson and Brown (2005) which determined that ERP holds the potential for productivity growth but may require changes in business practices. ERP has enabled organisations to change not only how they structure their organization, but also how they utilize people who are the key ingredient of the organization production function (Smith, 2008). The rapid improvements in ICT have had the overall effect of negating manual systems as most firms are continually automating operations. The use of ICT's like ERP is widespread and regarded as an essential tool in the pursuit of efficient administration, and in the delivery of services to clients (Lathman, 2011). The business world inclusive of the banking sector has been quick to embrace ERP systems in search of operational efficiency and effectiveness. More important is the observation that most firms in the world have invested more in ERP as the anticipated benefits of doing so have risen (Australian Productivity Commission, 2004). Thus different forms of ICT as argued by Vasudevan in Shaukat et al (2009) have within a short span of time become a necessity to every organisation.

The demand for ERP systems has been increasing globally in both service and manufacturing organisations (Chipeta, 2014). Additionally, Wanjiku (2011) makes a noteworthy observation that the demand for ERP systems is increasing due to increased exposure by local organisations to global business practices and consistent economic growth. Traditionally organizations have been composed of different dispersed units and technology, in the form of Enterprise Resource Planning Systems (ERP), has come in to provide an integrated enterprise-wide system (Sobhani, 2008). There are different

kinds of ERP systems, one of which is Oracle ERP system. ERP systems like Oracle ERP are integrative platforms, which integrate business processes that include marketing, human resource and finance of an organization (Matende & Ogao, 2013). Thus they are integrated IT software systems comprising of several modules that share a central database designed to automate business processes across the enterprise. ERP systems present a radical shift from the old legacy systems that were largely characterized by manual processes and isolated or partially integrated business units (Bailey, Seymour & Van Belle, 2017). The legacy systems are associated with manual and non-integrated operations, outdated technology, and are no longer or poorly supported by their developers. The consequence of this is that the old legacy systems are proving highly inefficient in a rapidly changing business environment. ICT in the form of ERP systems are very expensive and risky ventures, and are normally associated with technical and managerial challenges (Shaukat, 2009). However, as observed by the study of Bailey et al (2017), the benefits of ERP systems inclusive the worker productivity can be ascertained through the engagement of the users of the system. Despite the benefits, extant research is uneven and fragmented, focusing on managerial and technical perspectives, hence ignoring social and user considerations (Svejvig, 2013). In addition, the problem of assessing the benefits of ERP systems is less well studied and understood despite the observation that the difficulties experienced in measuring the business value of ERP systems are not a typical of most ICT projects (Chand Hachey, Hunton, Owhoso & Vasudevan, 2005).

It has become imperative for many organizations, in the quest of strategic management to perpetually seek investment in various forms of ICT such as ERP in pursuit of improved productivity; hence worker productivity is of pivotal importance to the

achievement of this objective. In addition, measurement of returns of investments inclusive the productivity returns is a non-alienable aspect of many organizations (Sobhani, 2008). Therefore, this study is an exploration of the relationship between ERP usage and worker productivity.

1.2 Statement of the Problem

The Reserve Bank of Malawi, just like many players in the financial sector has constantly sought improvements or refinements in its operations in order to better carry out its core function of financial regulation. This has been necessitated by the realization that the most productive firms are those that have streamlined their operations in the most efficient manner. This has been aided in part by the understanding of the role played by ERP in fulfillment of organization objectives, one of which is the insatiate desire for productivity. It should be strongly noted that improved productivity has always been a core objective of ERP implementation at the Reserve Bank of Malawi. Of particular interest is the productivity of individual workers of RBM who are the primary users of the systems.

Despite the growing investments in ERP technologies at the Reserve Bank of Malawi, no serious examination has been undertaken to gauge the extent to which the technologies have impacted on individual worker productivity. Increased productivity inclusive the worker productivity has always been part of the lofty expectations of adoption of ERP technologies at RBM. Productivity growth is a prime expectation from the development of new work methods based on new technology and production techniques (Sobhani, 2008).

This gap is attributed to a number of factors. Firstly, much research on ERP has focused on ERP implementation. This is largely because most ERP implementation projects end in failure hence the need for effective implementation. This aspect of the problem is further cemented by the study of Beheshti & Beheshti (2005), which observed that 51% of ERP implementation projects are unsuccessful. Further credence to this angle is provided by Saatcioglu (2009) who pointed out that ERP implementation is a big challenge with high rates of failure. The Second problem relating to the gap is that extant literature on ERP does not agree on how to measure the productivity aspect of the systems; the question of how to measure or gauge the benefits of ERP, inclusive the worker productivity aspect, has been raised but not fully analyzed (Chand et al, 2005). Specifically, this means that there is a lack of basis that can be used as a guide for assessing the benefits and success of ERP systems. Of particular interest is the lack of a general understanding of how ERP systems have impacted worker productivity. The problem has been propounded by a lack of a common agreement among various scholars on the definition of worker productivity (Hanaysha, 2015). In addition, a significant aspect of organizations for developing and implementing ERP systems is to evaluate and measure their performance.

This gap is heightened by the fact that most ERP systems are largely general purpose in nature as opposed to being tailor made. For a technology tool to positively affect performance or productivity it must be utilized and must be appropriate for the task and more broadly for the organizational context in which it is used (Al-Dabbagh, 2015). The implication of this is that technology must always incorporate the needs of the organization, which is not always the case with general-purpose systems such as ERP. As a result, general purpose technologies differ in terms of adding value to worker

productivity from context to context. Therefore, this study provides a contextual basis for gauging the impact of ERP on worker productivity by exploring the productivity of individual workers who are the primary users of the ERP systems.

1.3 Overall Objective of the Study

The purpose of this study was to explore the impact of Oracle ERP on the productivity of workers at the Reserve Bank of Malawi.

1.3.1 Specific Objectives

- i. To establish elements of ERP that enhance worker productivity.
- ii. To assess if ERP affects task completion at the Reserve Bank of Malawi.
- iii. To assess if ERP has affected decision-making at the Reserve Bank of Malawi.
- iv. To compare productivity of ERP and old legacy manual systems.

1.3.2 Research Questions

The research responded to the following set of questions

1.3.2.1 Main Question

- In what ways has ERP use affected the productivity of individual workers at the Reserve Bank of Malawi?

1.3.2.1 Specific Questions

1. Which elements of ERP enhance worker productivity?
2. Is task completion affected by ERP?
3. Does ERP enhance decision making?
4. How does ERP compare to manual legacy systems?

1.4 Justification of the Study

Realizing the un-abating importance of Information and Communication Technology (ICT), the study attempted to bring another important perspective of how Information technology in the form of ERP impacts worker productivity. The aim was to provide a managerial basis of exploring ways of enhancing worker productivity. This came from the consideration that the human element is a vital component of the organization hence the greatest determinant of organizational success. It is further hoped that the intended results of this study will make a lasting addition to the existing body of knowledge on how ERP affects worker productivity. This will also serve not only as a basis, but also as a reference point for further studies.

1.5 Structure of the Study

This study is structured as follows: Chapter One is an introduction to the study. In this chapter there is a discussion of the problem statement, research questions and objectives as well as the study justification. Chapter Two contains the literature review that provides information on the perceived relationship between ERP and manual systems, and how they relate to individual worker productivity. Chapter Three provides the methodology used in this study. It explains how data was collected and analysed. In Chapter Four, the findings of the study are presented and discussed. Finally, Chapter Five provides the conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section is an examination of relevant scholarly literature in relation to this thesis. The overall objective of this section is to assess how existing literature has explored the topic of ERP usage and perceived worker productivity. This was achieved by a discussion of concepts of ICT and ERP with a focus on how they relate to worker productivity. The section has also further explored literature explaining different relationships such as; productivity and ICT, ERP elements and worker productivity, ERP and task completion, and ERP, involvement of workers in decision making and comparisons of ERP and manual systems. In addition, the section has further presented and discussed the conceptual model on which the study is built.

2.2 Information and Communication Technology

Information and Communication Technology (ICT) is defined as the hardware, software, telecommunications, database management, and other information processing technologies used to store, process and deliver information (Kimani 2015). ICT has become a de facto norm of many modern organizations. This is largely attributed to the volatility of the modern business environment that is constantly experiencing different changes (Khomba, 2014). In addition, the volatility of the modern environment relates to the fact that organizations grow and change, hence they depend more and more on information technology for their survival (Feeny & Willcocks, 1998). This phenomenon has also been heightened by the fact that economies are becoming more

and more knowledge based, hence organizations are tending to rely heavily on ICT solutions in order to develop and grow their businesses (Asgarkhani & Young, 2010). ICT has become a strategic tool for modern organizations by allowing users to become more efficient and effective and thereby relevant in the ever changing business world. This is further augmented by the study of Ssewanya (2009) which synthesized ICT as a strategic tool that not only allows users to become more efficient, but also effective.

Apart from liberalization and consolidation of financial markets, and deregulation of financial intermediation, ICT innovations have also been identified as behind the radical transformation of banks (Biyaki, 2010). The overall consequence of all this is that the banking sector has become technology dependent as evidenced by huge investments in ICT. Banks have used ICT to modify their operations mainly through the use of automated systems like ERP (Biyaki, 2010).

2.3 Enterprise Resource Planning Systems

In the current age where knowledge economies are on the increase, organizations are faced with the challenge of making the different types of systems they use work together seamlessly in pursuit of productivity (Bailey et al, 2017). Another challenge of organisations also relates to the dynamism of the business world which has necessitated the need for continuous improvement of business practices and procedures. This among other things, has seen organizations increasingly sharing with their suppliers, distributors, and customers the critical in-house information they once aggressively protected (Umble et al, 2002).

To accomplish business objectives, organizations are increasingly turning to ERP systems. ERP is a software package that attempts to integrate all departments and functions of an organization into a single computer system that can serve different needs of departments (Genoulaz & Millet, 2005). The systems have tended to be flexible as they can be adapted to the specific needs of each organization (Khattab et al, 2012). Organizations may be composed of separate and dispersed functional units that may require integration. Therefore, ERP has an integrative effect on business function areas such as; procurement, inventories, production, sales, human resource management, marketing, engineering etc., and thereby helping all business units function seamlessly as one to produce a designed output (Khattab et al, 2012). ERP systems have a number of characteristics such as:

- Designed for a client server environment whether traditional or web based.
- Integrate the majority of a business's processes.
- Process a large majority of an organization's transactions.
- Use an enterprise wide database that typically store each piece of data once
- Allow access to data in real time

ERP software is made up of a number of modules or components selected on both technical and economic feasibility for given organizations. This in turn enables technological components used to facilitate transactions, these include; workgroup, workflow, groupware, electronic data interchange, the internet, intranet and data warehousing (Madhanire et al, 2006). Cost reduction, efficiency, transparency and improved customer service are some of the perceived benefits of ERP systems (Matende, & Ogao, 2014). There are different variants of ERP systems but the most well-known and widely used ones are: Oracle applications, SAP R/3, PeopleSoft, and

Baan (Chand et al, 2005). However, the question of the benefits of ERP systems is a subject of an ongoing debate among scholars.

2.3.1 Development of ERP Systems

ERP usage can be traced back to the early 1990s when many organizations in the world started turning to modern technologies in ICT (Caldeira & Ward, 2002). This surge in ICT adoption and usage was largely fueled by the need for organizations to stand out against competition in the ever increasingly competitive business world. The evolution of ERP systems closely followed the spectacular developments in the field of computer hardware and software systems (Rashid et al, 2002). During the 1960s most organizations designed, developed and implemented centralized computing systems, which were mostly used for inventory control and management (Rashid et al, 2002). These were largely based on the old largely manual legacy systems of performing tasks, which were proving to be ineffective as the business environment kept on changing. Chipeta (2014) notes that in the 1970s organizations started to look for ways of minimizing costs and thereby leading to the development of Material Requirements Planning (MRP) Systems. These mainly involved planning the product or parts requirements according to the master production schedule (Chipeta, 2014). Further refinements and modifications were made to MRP systems to include shop floor and distribution management, project management, finance, human resource, engineering among others. (Rashid et al, 2002).

Modifications and additions in the late 1980s and early 1990s resulted to ERPs systems with the power of enterprise wide inter functional coordination and integration (Rashid et al, 2002). Some of the benefits of ERP systems include: shorter manufacturing cycles, increased communication within the firm and with customers, better supply chain management, cost reduction, integration of business units, and greater control of operation management (Chipeta, 2014). On the other hand, disadvantages of ERP system include: high vendor dependence, high purchase and running cost, time consumption and complexity (Chipeta, 2014).

2.4 Productivity

Productivity is one of the most key preoccupations of organizations hence the most watched indicator of long-term economic prospects. Institutions like the Reserve Bank of Malawi seek to attain high levels of productivity, and changes in technology are touted as the only source of permanent increase in productivity (Ratnar & Kau, 2016). The concept of productivity is multifaceted as evidenced by different definitions advanced by different scholars from different backgrounds. In Persian literature, it refers to usefulness and profitability (Rezaei et al, 2014).

On the other hand, the Japan Productivity Centre defines productivity as to maximize the use of physical resources, human resources and other factors of production (Rezaei et al, 2014). Brynjolfsson (2003) as quoted by Smith (2008) defines productivity as the amount of output produced for a given amount of input. Central to the various definitions of productivity is the ability to achieve efficiency and effectiveness, which among other things entails lower production/operation costs, expansion of markets

among others (Khomba, 2014). Productivity dates back to the use of the spinning wheel which made people more efficient (Al Dabbagh, 2015).

At the workplace, productivity is concerned with organizing the workplace in ways that could maximize efficiency (Al Dabbagh, 2015). The notion of productivity received further refinement during the industrial revolution when use of machinery replaced the manual workforce in manufacturing. The systematic study of the concept of productivity can be traced to Fredrick Taylor who studied the productivity of workers in manufacturing by precisely timing movements within factories (Al Dabbagh, 2015).

Productivity has different dimensions or levels, the first of which is organizational productivity (Al Dabbagh, 2015). At this level the prime focus of managers or business owners is on utilizing the right resources for the best outcome (Stadt et al, 1988). Another level of productivity, which is the main focus of this study, is the micro level of productivity, which can be viewed from an individual worker perspective (Al Dabbagh, 2015). However, it should be noted that the micro level of productivity is a subset of organizational level productivity. In addition, assessment of productivity is also done from two different aspects namely: financial and performance aspects. A Dabbagh (2015) postulates that performance productivity is concerned with the number of outputs produced, while financial productivity is based on the monetary value of outputs. From these discussions, it then becomes imperative to conclude that the notion of productivity is an overall indicator of overall performance regardless of the level it is analyzed at or the aspect it is assessed from.

Therefore, this study focuses on perceived productivity of workers in relation to usage of Oracle ERP.

2.4.1 Worker Productivity Variables

Worker productivity has become an integral aspect of the workplace (Cresnar & Nedelko, 2010). The ideal situation for productivity is where output increases while input remains the same, or where output increases more than an increase in inputs (Al Dabbagh, 2015). Worker productivity is a significant component of organizational success, and is often used as one of the main success factors of technology adoption in the work place (Francalanci & Galal, 1998). Worker productivity is also referred to as individual impact or personal productivity (Al Dabbagh, 2015). Similarly, Davis (2002) understands Worker productivity as a change in work efficiency, effectiveness and better control and use of time. That is, productivity in the context of ERP, is determined by the efficiency and effectiveness of employees' work tasks through the use of technology. Thus, ERP is viewed as a necessary input for achieving worker productivity. Therefore, issues of efficiency and effectiveness play a crucial role in determining worker productivity and the role of ERP is to induce the same.

However, it should also be noted that worker productivity is a function of a number of variables, and the role of technology like ERP is to make them work seamlessly together. Access to information is an important variable for measuring worker productivity in relation to technology (Al Dabbagh, 2015). The common assumption is that ICT results in improved or instantaneous access to information, which enables workers to execute tasks effectively and thereby achieving productivity in the process (Al Dabbagh, 2015).

Efficacy, which is the ability to produce desired results, is an important variable of productivity in the banking industry, and it relates to achievement of targets and objectives (Rajan & Baral, 2015).

The assumption is that use and ability to achieve intended results is largely dependent not only on the use of appropriate ICT systems, but also the manner in which the systems are used. There is also semblance between productivity and efficiency in the sense that efficiency is a subset of productivity and hence a defining variable (Rajan & Baral et al, 2015). That is efficiency is an important indicator and measure of productivity not only at RBM but also in many organizations. Efficiency is the comparison of what is produced to what can be achieved with the same inputs and it entails doing the right things and largely relates to the goals of the organisation (Sobhani, 2008). Efficiency at RBM entails using the Oracle ERP system at maximum capacity to achieve the intended objectives. Organizational efficiency variables include: reduced errors, time saving, and ease of work. Other productivity variables employed by this study include: access to information, reduced paper work, volume of work, and the degree of decision-making.

2.5 Productivity and ERP

The full benefits of productivity improvement are realized when productivity is examined from two perspectives: operational efficiency (output/input) of an individual worker or a business unit as well as performance (effectiveness) with regard to end user (Beheshti & Beheshti, 2006). This observation underscores the importance of the human element to the concept of productivity. There is a raging debate regarding the impact of ERP/ICT on productivity, and this has been heightened by different views

emanating from different studies. On one divide of this debate are those researchers who have concluded in favour of a positive relationship between technology and productivity in particular worker productivity. Precisely, some authors like Castel & Gorriz (2007), have highlighted that the implementation of ERP provides higher productivity, more satisfaction for customers, more value creation etc. Hannah (2003) in Latham (2011) provides augmentation to the positive relationship between ERP and productivity by stating that “ERP enhances the production process in organizations as monitoring technologies could be used to reduce the number of supervisors required in the process”. Further support to this position is provided by the studies of Bertschek & Kaiser (2004), and Brynjolfsson & Hitt (2002) in Martin (2011) that reached the conclusion that ERP combined with workplace reorganization has positive and significant effects on productivity at the firm level. However, the studies in question further point out that the effects of technological and organizational changes have been largely neglected at the worker or employee level.

The positive effects of ERP systems on productivity have been cemented by the study of Fryer (1999), which concluded that productivity improvement is one of the top four tangible benefits from ERP implementation. The implication of this is that ERP helps in increasing productivity by acting as an aid to supervision. Further evidence of the positive semblance between ERP and productivity is provided by Avantis & Loukis (2009) who noted that the systems enhance productivity through information gathering and dissemination, inventory control and quality control. In a similar vein, the study by Kimani (2015) postulated that worker productivity has increased due to increased diffusion of information. The implication of this is that there is high access to

information which workers use to add value to task performance, and thereby achieving high levels of productivity.

On the other hand, other scholars have argued that ERP does not always translate to high levels of productivity. For example, the study by Mahmood and Mann (2000) demonstrated that increases in performance and productivity are not solely reliant upon ICT or ERP investment. This implies that productivity is a function of a combination of many factors including ERP. In connivance with this assertion is Smith (2008) who concluded that investments in ICT must occur in unison with changes in work processes, if this is implemented, the effect on productivity will be greater than investment in ICT alone. Similarly, a study by Parsons, Gotlieb, & Denny (1990) estimated a production function for banking services in Canada and found that overall; the impact of ICT on a multifactor productivity was quite low between 1974 and 1987. Similar findings were reached by Kimani (2015) who found that ICT was associated with a sharp drop in capital productivity and stagnation in labour productivity, but remained optimistic regarding the potential of ICT to increase productivity.

The study by Castel and Gorriz (2011) further painted a grim picture on the effect of ICT on productivity by noting that availability of ICT alone does not guarantee success or productivity. On the contrary, it requires that firms follow ICT innovations with the best organizational practices. This means that productivity cannot be achieved in the absence of a fit or compatibility between technology and organizational work. The perception is that work compatibility is strictly about the fit of ICT to organizational work, and not to personal preferences or work habits (Sun, Bhattacharjee & Ma, 2009). This is because organizations deploy ICT for the prime purpose of furthering or

facilitating organizational work rather than matching it to users' personal preferences or habits.

The problem of correctly ascertaining the relationship between ERP and its benefits has further been propounded by a lack of an analytical framework for examining the potential benefits after successfully implementing an ERP system (Chand et al, 2005). The study by Markus and Tanis (2000) has attempted to solve this challenge by identifying various reasons that motivate organizations to implement ERP Systems. The study also underscored the importance of establishing a connection between reasons for adoption and the benefits. In a related vein, the study by Genoulaz & Millet (2006) has also negated the productivity impact of ERP systems on account of their failure to help organizations achieve expected outcomes.

Cited benefits of ERP systems that amounts to productivity are categorized into financial benefits like reduction of operating costs, and non-financial measures such as: reduction in data errors, improved efficiency of business processes, and improved decision support (Chand et al, 2005). However, the benefits as indicated in the study are not automatic as their realization is both a function of firm wide and non-firm wide characteristics.

The cloud relating to the impact of ERP on productivity especially worker productivity can be related to the broad nature of the ERP concept. It should be noted that the semblance between ERP and Productivity can be better established by placing emphasis on the impact that specific forms of ICT like Oracle ERP have on worker productivity.

2.6 Elements of ERP and Worker Productivity

Worker productivity is particularly an issue of prime importance to managers and supervisors as the core function of their job is to get the most out of the people they are responsible for. This comes from the recognition that workers are the pillars of success of any organization. In today`s cost-competitive world, the emphasis is on getting things done through increasing the productivity of workers. Therefore, forms of technology like ERP are seen as a means of achieving this end. Informational, work standardization, and integrative aspects of ERP have been touted as having a positive effect on worker productivity.

Several studies have attempted to highlight the relationship between ERP elements and worker productivity. For instance, the information element of ERP has been singled out as having profound effects on worker productivity. For example, the study by Khattab et al (2012) observed that empowering workers by giving them timely information boosts productivity, as ERP promotes information sharing. This is possible because data is centrally stored in a single database.

Further credence to the positive relationship between ERP and worker productivity is provided by the study of Elragal & Haddara (2012) which highlighted the single shared database element of ERP which functions as a hub that stores, shares, and circulates data from within the different departments and business functions, as adding immense value to worker productivity through the improved informational aspect. This indicates that highly accessible and accurate information is an inalienable aspect of productivity.

According to much theoretical and empirical evidence, forms of ICT like ERP offer benefits for a wider range of business processes by largely improving information and knowledge management within the firm, leading to better performance including improved worker output (Castel & Gorriz, 2011).

Some studies have also concluded that ERP systems have a combined albedo of routinizing tasks and thereby impacting positively on worker productivity. This is the case as ERP systems come with particular procedures for task performance as workers only stick to relevant processes defined and permitted by the system. Routinization of tasks involves adoption of best practices that add value to the production function of organizations. In this case forms of technology like ERP often serve as a link between the business model and the critical drivers of success (Kimani, 2015). ERP systems are built on generic business rules and procedures (Chand et al, 2005). Thus, each implementation requires tailoring and customizing the modules based on the business practices of the organization. This entails reengineering many of the business processes of the organization in the most productive manner. Chipeta (2014) argued in the similar vein by stating that ERP systems provide for standardized practices across the functions of the organization and thereby ensuring productivity.

The Integrative aspect of ERP has also been singled out as having profound effects on worker productivity. ERP integrates business processes and information systems across functional silos, and this involves business process engineering and system configuration, which requires the organization to take risks and be innovative in designing new business practices in the light of ERP functionalities (Ke & Wei, 2015).

Individual workers are a source of these innovative ideas and hence an organizational culture of learning is developed; this improves worker productivity through enhanced productivity and ability to notice novel opportunities (Ke & Wei, 2015).

In addition, the element of visibility of information provided by the common shared database not only empowers workers to do their work more efficiently and effectively but also makes them more visible to others who can easily exercise process and outcome control in the organization (Rajan & Baral, 2015). The effect of this is that there is simultaneous increase in the control and empowerment occurring through the mediating effects of information visibility (Rajan & Baral, 2015). The positive relationship between ERP elements and worker productivity is further reinforced in the study of Yoon et al (2009) which shows that when an ERP system is implemented in an organization, organizational knowledge such as best practices and process design techniques based on ICT are also transferred to workers, thereby making them more productive.

On the other hand, some studies have highlighted the negative impact of ERP on productivity. For example, the study by Khattab et al (2012) observed that integrative elements of ERP that intended to standardize processes within the organization tended to reduce worker productivity as it did not promote creativeness and innovation. This is further observed by Matende et al (2013) who argue that implementation of ERP systems brings in changes in the way people work and these may include job cuts and rationalization of responsibilities which evoke resistance from workers and thereby affecting their productivity. This was attributed to the feelings of loss of

competitiveness and uniqueness in terms of efforts on the part of workers when working with systems that imposed commonalities.

The positive relationship between ERP and worker productivity has also been negated in the study by Al Dabbagh (2015) which has postulated that ERP results to flexibility which facilitates long work hours and as a result, higher stress. The stress in question is referred to as techno stress- the stress caused by technology. Techno stress has been shown to significantly reduce worker productivity (Al Dabbagh, 2015). A further observation of this was made by Hannif, Cox & Almeida (2013) in the study on North American call centers, where it was noted that ERP facilitated and increased more pervasive forms of surveillance and monitoring which led to work intensification, and associated pressure and stress. It should be further noted that success of the ERP implementation is largely dependent on the human resource element. For example, Sobhani (2008) noted that ERP solutions succeed when training is implemented quickly and efficiently, and thereby underscoring the importance of people to successful use of technology. In addition, as observed in the study by Bailey et al (2017) successful implementation of ERP products in Sub Sahara Africa is likely impeded by cultural, economic and infrastructural problems. This also means some components of ERP are contextual as they may not register success in other environments. The problem in gauging the impact of ERP elements or components on worker productivity is largely because most studies have neglected the worker who is the end user. For example, Ahmad and Basden (2013) in their study noted that extant research approaches have primarily focused on supplier aspects, senior management concerns, without adequate focus on the actual user's issues.

2.7 ERP and Task Completion

The ability to complete tasks in time and also with quality is the hallmark of any progressive organisation and hence productivity. The concept of worker productivity in the context of task completion in most organisations is better gauged in terms of volume of work and time taken to complete tasks.

2.7.1 ERP and Volume of Work

One envisaged goal of implementing ERP systems by most organizations is improvement in volume or output of work. Thus improved volume of work entails an increase in terms of products and services. Several studies have attempted to highlight the semblance between ERP and work volume. For instance, Kimani (2015) concluded that utilization of ICT/ERP tools has an important influence on the organization and all its elements including people, process and tasks.

The study findings also indicated that ERP improved the volume of work as the technology enabled them to perform their duties effectively. These findings are further supported by the study of Abri (2014) who in the context of Iran, concluded that ERP can improve volume of work by changing older and less productive models to more effective e-business models. In addition, Chand et al (2005) highlighted that ERP systems are built by tailoring and customizing the modules based on best practices of the organization. That is ERP enables work to be performed using efficient processes and procedures that have the overall effect of improving the volume of work. Chand et al (2005) further observes that benefits of ERP extend to improvement of volume of work due to the automation of cross functional processes.

This process entails reengineering many of the current business processes and in turn this helps in reducing process errors, and improves efficiency. That is operational benefits of ERP results to an improvement in work volume. Related to work volume is also quality of work where some studies have shown that ERP systems positively impact quality of work. For example, Mjema & Mwinuka (2005) demonstrated that the introduction of ICT in quality management had contributed greatly to the enhancement of quality awareness towards the improvement of services and products and in reduction of quality costs. This is further augmented by the study of Yoon et al (2009) which noted that ERP leads to high quality information which impacts greatly on efficiency and hence not only volume but also quality of work. However, other studies have attributed the lack of a positive relationship between ERP and work volume on a lack of fit with key organization aspects.

For example, Castel & Gorriz (2008) concluded that business management capabilities are growing in importance rather than, ICT alone. In that case, usage of ERP systems does not translate to high work volumes. In addition, the study by Al Dabbagh noted that forms of technology with an aspect of the internet at times impacts negatively on volume of work. The study points out that internet based technologies like ERP gives workers room to disengage from work and do other extraneous activities like compulsive checking of emails and using social networking platforms such as Facebook, and such behavior results in reduced work volume hence low worker productivity.

2.7.2 ERP and Task Completion Time

Over the recent years, ERP has become an integral part of many organizations and individuals. Among other things as observed by Al Masharia, Mudimigha & Zairib (2003) it has altered the way individuals think, interact, and more importantly how they complete their tasks. This observation is also in line with the findings of Bailey et al (2017) who notes that ERP brought about a technological revolution, which modified not only the manner in which individuals conduct business, but also the way in which people complete daily activities.

That is ERP has profound effects on how workers function at the work place in relation to task completion. According to the study by Al-Dabbagh (2015) presently ICT is viewed as a necessity and its absence in the workplace causes major dissatisfaction. In support of this, the study by Chipeta (2014) discovered that ICT in the form of ERP has resulted to shortened processes which have led staff to working within hours hence no overtime costs and improved task completion time. This observation is shared by the study of Chand et al (2005) who concluded that ERP improved decisions in inventory management and man power planning in the processes which not only contributed to cost reduction but also improved task completion time and thereby leading to proactive and timely service to customers.

On the other hand, some studies have shown that over reliance on ERP has negative effects on task completion time. Al-Dabbagh (2015) concluded that task completion time is affected as the work becomes more intense, workers are displaced, surveillance increases, workers' bargaining power is reduced and their skills (in many cases) become obsolete, devalued, or constrained by ERP imposed structures. The study by Al-

Nashimi et al (2014) highlights the negative effects of ERP on work or task completion time such as; increasing work demands and hours, higher stress levels and the difficulty to disconnect from work when at home.

It has also been observed by Al Dabbagh (2015) that at times positive impacts of ERP are achieved at the cost of inefficient use of time which has the resultant consequence of affecting task completion negatively. This is because the internet which is an inalienable component of ERP systems and ICT in general allows for instant access to information; however, at the same time it causes the need for re-work, wading through extraneous material and thereby leading to longer time for task completion. This means internet based systems can create inefficiencies due to workers wasting time on other matters other than those connected to the task.

2.8 ERP and Decision Making

One important attribute of most productive organizations is the ability to make quick and high quality decisions. Ownership and effective implementation of decisions increases with high participation of workers in the decision making process along with the overall effect of increasing worker motivation. Scholars have provided contrasting opinions regarding the relationship between ERP systems and worker decision making. On one side are studies that have established a positive relationship between ERP and worker decision making. For example, the study by Bailey et al (2017) observed that the ability to influence work changes and voicing of opinions was perceived to improve the most with the introduction of ERP in Some Sub Saharan organizations.

Thus ERP accorded workers more powers to make decisions thereby have more control on work. ERP systems, as observed by the study of Matende & Ogao (2013) are considered to be built on best business practices and thus the user may be required to make decisions regarding changes to business processes and procedures in order to fully utilize the system thereby promoting workers' decision making. Ke & Wei (2015) further observes that ERP adds value to the decision making process of workers by empowering those at the frontline to make ad hoc decisions in response to market changes and be responsible for their behavior. Holsapple & Sena (2002) went on to identify pivotal elements that support the worker decision making process.

The elements in question include tools for data communications, data access, data analysis and presentation, assessing data context, synthesizing data from other sources, and assessing completeness of data. Among others, the same study by Holsapple & Sena (2002) concluded that ERP adds value to productivity by supporting worker decision making in several ways such as; enhancing the decision makers ability to process knowledge, improving reliability of decision processes or outcomes, shortening the decision making time, reducing decision making cost among others.

The positive aspect of ERP on worker decision making has further been strengthened by Al Nashmi & Amer (2014), who in the context of Yemen observed that ERP/ICT not only empowers workers to make decisions, but also ensures quality of decisions. This, they note, is because of better time utilization, information sharing, better communication not only among the staff, but also with customers, hence leading to improved worker productivity. Similarly, Bailey et al (2017) discovered that technologies like ERP lead to decentralized decision making which highly empowers workers to make decisions unlike centralized decision making. It is further noted in the

study by Rajan & Baral et al (2015) that ERP has brought about expanded access to information which not only gives the workers the added flexibility, but also allows them to make decisions which used to be formally referred upwards or to other departments. The informational element associated with ERP systems has also been singled out by Khattab et al (2011) as having an empowerment effect on workers resulting to timely and accurate decisions that boosts productivity. However, other studies have shown a negative relationship between ERP and worker decision making. For example, Al-Dabbagh (2015) noted that ERP/ICT impedes worker decision making as tasks become highly routinized hence giving them little room for creative decision making.

The effect of this is that decision making becomes limited as decisions are based on ERP system prescriptions and thereby weakening innovation which is the pinnacle of productivity in decision making. Further credence to this observation is provided by Al Dabbagh (2015) whose study posits that at times ERP eliminates the quality of information and thereby resulting to low quality decisions on the part of workers. Thus certain forms of ICT inclusive the ERP system prevents users from seeing facial expressions and gestures which are expressive behaviors that can explain richer information exchange, and in turn affect quality of decisions and worker productivity. The study further posits that the high degree of connectivity associated with ERP systems entails that workers have information within easy reach. While this has the implication of making workers more efficient in decision making, in other cases it also reduces decision making abilities due to the information overload from an over reliance on technology. White et al (2000) has further pointed out that information overload can lead to a reduction in productivity.

A similar position is presented by Chan (2001) who contends that technology can process information much faster than the rate at which people can process it, and

thereby finding themselves unable to cope with an ever increasing amount of information and therefore a reduction in productivity occurs. This phenomenon stems from the Cognitive load theory (CLT) which postulates that an individual performs well only when his or her working memory is minimal (Al Dabbagh et al, 2015). The CLT can also be likened to the law of diminishing returns on investment which is grounded in the field of economics which says that when there is an excessive amount of a resource inefficiency starts to set in.

2.9 Comparisons of ERP and Manual Systems

Several studies have attempted to draw a comparison between ERP systems and largely manual legacy systems. The comparisons have rested on potential benefits of the two systems with those of ERP outweighing those of manual systems. For example, Sumner (2005) compared the productivity of the two systems on the basis of the informational element. His study observed that since ERPs are more productive as they store information in a central place where it can be accessed and shared by functional departments, and this eliminates the need for legacy manual systems that maintain incompatible and fragmented data. In addition, ERP systems have been cited for their superior data processing, storage and retrieval (Sobhani, 2008), and hence touted for registering higher levels of productivity than their manual counterparts. In addition, the productivity of ERP systems has been attributed to its integrative effect on business functions of an organization, where all business units function seamlessly as one unit (Sobhani, 2008). This is unlike manual legacy systems where business units function as separate entities and hence having inferior levels of productivity.

ERP and manual systems have also been considered on the basis of time of reaping benefits. Manual systems have been noted for their ability to register productivity

benefits in the short term than ERP systems. Khattab et al (2012) attribute this to the fact that ERP systems takes a long time before realizing the benefits of investment. Comparisons have also been made regarding the implementation process of the two systems with ERP systems registering a high failure rate than manual or legacy systems. For example, Bailey et al (2017) concluded that ERP projects showed difficulties and even failure in implementation.

The high failure rate was attributed to technical complexity associated with the implementation process of ERP which requires a great deal of expertise, and the mismatch between technical specifications of ERP and business requirements of the organization (Khattab et al 2016). Therefore, it can be postulated that ERP unlike manual systems are associated with long term productivity benefits.

In addition, ERP systems are also associated with high dependency on vendors who are the main source of system upgrades. The study by Sobhani (2008) observes that over-reliance on third parties in form of software and hardware vendors can affect productivity of workers and organisations in general as firms do not have control of their inefficiencies. In line with this observation, Chipeta (2014) postulated that ERP systems require constant and periodic upgrades, which when not performed impinge worker as well as organizational productivity. This is unlike manual systems whose main source of productivity is the ability of designated workers to perform tasks not only according to schedule but also in conformity with set standards.

Comparison between ERP and manual systems have also been drawn on the basis of rates of inefficiencies associated with the two systems. Several studies have cited in efficiencies in form of excess work force, errors, and work repetitions as being

numerous with manual rather than ERP systems. Thus ERP systems have been heralded as having low rates of inefficiencies than manual systems. For example, a study by Chipeta (2014) posited that ERP systems have low rates of errors and repetitions due to the automation aspect and ever improving processing abilities. The study by Al Dabbagh et al (2015) further rates ERP systems highly over manual systems in terms of ability to eliminate inefficiencies due to Business Process Re-engineering. That is BPR results in the restructuring and reorganization of work process through adoption of best practices that ensure elimination of repetitions, errors, excesses or wastages.

2.10 Conceptual Framework

A conceptual framework focuses on the main dimensions to be studied, the factors of variables, and the presumed relationship between them, or in other words, something that explains, either graphically or in narrative form, the main things to be studied (Miles & Huberman 1994, in Sobhani 2008). Researchers synthesize ideas to build a basic understanding of the world or a particular phenomenon, and such concepts are illustrated in a model. Therefore, models are simplified representations of phenomena reflecting key features of the world important to a researcher (Al Dabbagh et al, 2015). Worker productivity in relation to Oracle ERP usage at the Reserve Bank of Malawi is determined by a number of variables and these include: volume of work, time taken to complete tasks, time taken to make decision, type or level of decision making, time taken to approve orders etc. The basis of this conceptual framework is provided by the model of the organization by Leavitt (1965) who contended that interrelated components of an organization are: structure, people, strategy and technology. The

model contends that the interaction of these four components determines the fate of an organization (Leavitt, 1965). The model is used to manage organization change.

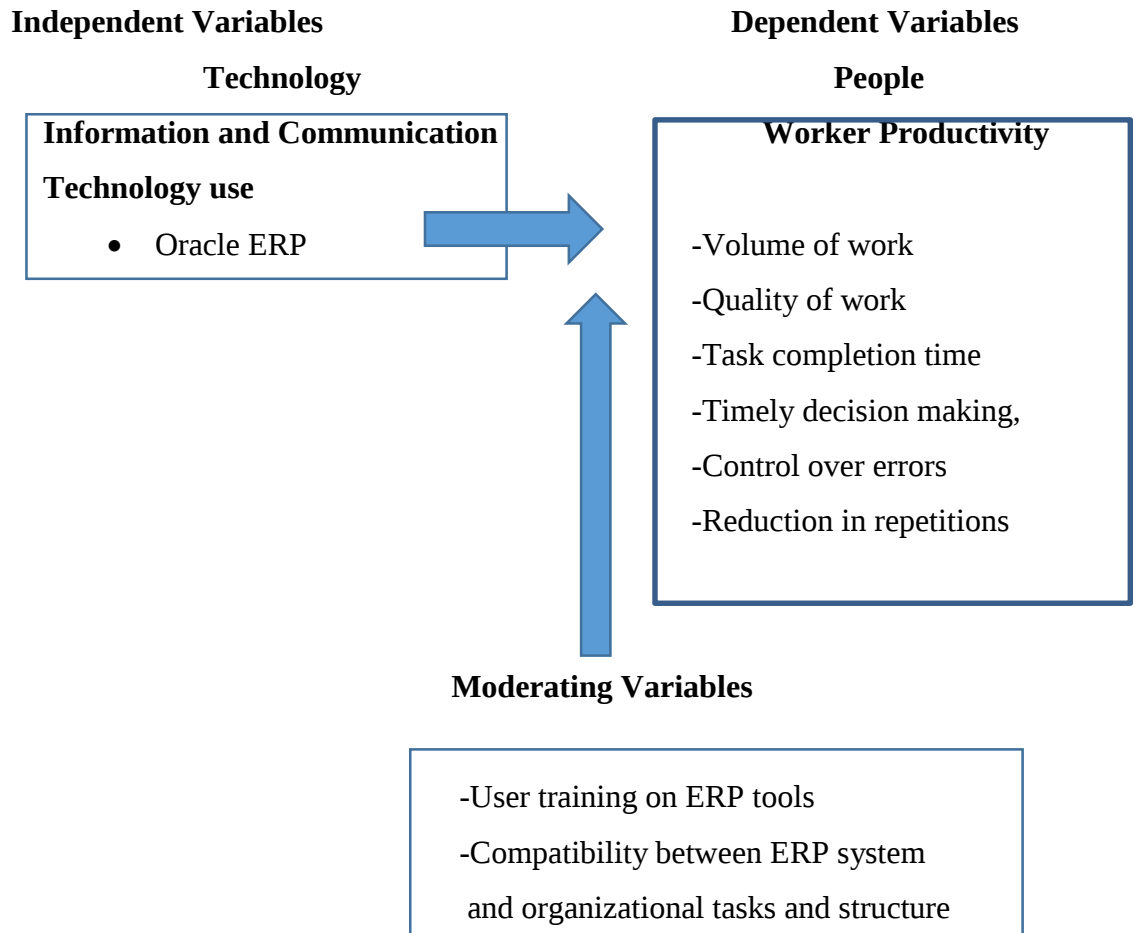


Figure 1: Conceptual Framework

Adapted from the Diamond Organization model of Leavitt (1965)

The basic presumption of the model is that a change in any of the four components entails changes in the other three. This means that the introduction of ERP system, or any new information technology, requires careful consideration of the associated business processes, people involved and the organizational culture (Thakur, 2019). The model considers people as components of the organization in terms of their skills, efficiency, knowledge and productivity (Thakur, 2019). Change in technology has

many implications to an organization, one of which is that it requires extensive training, so that the workers can handle the new technology efficiently (Thakur, 2019).

Change in technology also requires changes in the way tasks are performed; this is the case because goals are raised to reap benefits and to cover costs of the technology. In addition, structural changes are required in an event of technological change as new job posts are created and old ones are closed down in order to make the best use of the new technology. The Diamond Organization model presents many propositions and relationships relating to the four components. However, the conceptual basis of this study is a modification of the organization model in question with its main focus on the relationship between people and technological components of the model. Essentially, the model narrowed the focus of this study to the people and technological aspects of the organization model. This is because many associations could occur in a model, however researchers decide on which associations to include and which to eliminate based on their views (Weber, 2012 in Al Dabbagh, 2015).

2.11 Chapter Summary

The aim of this chapter was to discuss the empirical foundations of this study. The chapter discussed different themes emerging from literature on ERP and worker productivity. However, the reviewed literature has not shown directionality in terms of elucidating the relationship between ERP usage and worker productivity. The lack of directionality is because both positive and negative effects of the relationship between ERP and worker productivity have been found in the literature.

Therefore, directionality can better be established by studying the relationship in a specific and specialised context like that of the Reserve Bank of Malawi. Thus the

majority of the available literature focusses on the general context of ERP rather than specific context like that of the RBM hence this poses difficulties in ascertaining proper directionality.

Similarly, the majority of literature reviewed on impact of ERP systems has measured productivity at the organisation rather than at the individual level which is a building block of organisational productivity. Therefore, this study is an attempt to provide productivity of ERP systems by focussing on the impact of the systems at the individual level.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter is a presentation of the route map used by this study. The chapter commences with a discussion of the research paradigm which has guided the development of the research methodology. The chapter also gives a description of: the research process, the research design, approach and strategy of this study. The section also contains a description of sample methods, data collection methods, reliability and also validity, and also ethical considerations of this study.

3.2 Research Design

Research design involves formulation of plans, procedures and strategies for research that span the decisions from broad assumptions to detailed methods of data collection (Cresswell, 2009). Thus research design involves integration of the different components of the study in a coherent and logical way, thereby ensuring that the research problem is addressed effectively.

3.2.1 Research Approach

The overall methodological approach of this study is the mixed methods approach. This approach involves integration of both qualitative and quantitative methods of research. The mixed approach was adopted by this study for three main reasons. Firstly, the method offered the opportunity for triangulation which entails using different means to study the same phenomenon. This enabled the study to look at the phenomenon in more accurate ways through the use of different methods and techniques from different perspectives. Secondly, the mixed methods approach was best suited to this study as it

helped in offsetting the weaknesses inherent to using either of the research methods alone, hence reinforcing the findings of this study in the process. The method forms the basis for collection, measurement and analysis of data. This study employed the inductive approach to research. With this approach qualitative data are collected and a theory is developed as a result of data analysis (Saunders, Lewis, & Thornhill, 2007). According to Creswell, the qualitative approach is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant's setting (Cresswell, 2009).

The qualitative aspect which is inductive in nature, enabled this study to uncover attitudes and perceptions which are subjective in nature as postulated in the constructivist perspective by Cresswell,(2009). On the other hand, the quantitative aspect which is deductive in nature aimed at understanding the phenomenon by means of numerical data.

3.2.2 Research Strategy

The strategy employed by this study was the case study strategy. This strategy involves investigating phenomena in real life context (Saunders , Lewis, & Thornhill 2007). The underlying concept was to select a single targeted case and intensively analyze it to identify possible alternatives for addressing the research questions on the basis of understanding the context of the RBM. Selection of this strategy is given credence by Myers and Newman (2007) who contended that the case study approach is well suited to ICT research as it helps to study the use of technologies in organizations. Latham (2011) also observes that during the past decades, the reputation of case study has improved and today it is an accepted research method in the field of ICT.

The strategy is further advocated by Latham (2011) who argues that the method provides an opportunity to study a phenomenon within its natural context. Another concrete reason for using the case study methodology in the ICT discipline is simply because of the phase of technology change, where practitioners tend to implement new technology before researchers have the possibility to offer advice or propose changes (Latham, 2011). The case study strategy was also selected because the researcher works within the same RBM context and thereby having the rare opportunity of closely examining the phenomena under study. This had also the added benefit of helping the researcher negotiate easy access to participants to the study who were from the confines of her work environment.

3.3 Research Philosophy

The interpretivist epistemology which focuses on how people, as individuals or as a group interpret and understand things provided the philosophical basis of this study. This is because the development and impact of ICT or ERP in its nature is contingent, and socially situated and therefore needs to be grounded in theories of social action. Thus the goal is to understand the specific context in which the study is conducted. This philosophy was chosen because the study was rooted on observance of phenomena in a social context of the Reserve Bank of Malawi. The study was conducted as an interpretive single case research. In addition, an interpretivist perspective is highly appropriate in the case of business and management research, particular in such fields as organization behavior, marketing and human resource management (Saunders , Lewis, & Thornhill, 2007).

3.4 Research Setting

A setting refers to the physical environment in which the study is conducted. This study was conducted in the natural setting of the Reserve Bank of Malawi. The study area was chosen for convenience reasons as the researcher works there and thereby much familiar with the environment of the study area. The study was spread among staff in all the 14 departments of the bank that are linked through Oracle ERP. The overall objective was to ascertain the link between worker productivity and ERP usage.

3.4.1 The Reserve Bank of Malawi and ERP

The Reserve Bank of Malawi (RBM) has over the years invested in modern information technology with the overall result of migrating from manual systems to automated ones as facilitated or enabled by ICT (Chipeta, 2014). The reserve Bank of Malawi (RBM) was established under an Act of Parliament on 23rd July 1964 and started its operations in June 1965 (RBM Act, 2010). The RBM Act was revised in 1989 to provide for total independence from government in areas of monetary policy and issuance of the Malawi currency (RBM Act, 2010). The revision further resulted in the stipulation of the bank's principal functions which were in tandem with the national economy and economic policies of government. Further revisions to the Act were made in 2010. According to the RBM Act (2010), some principal objectives of the Bank are:

- a. To issue legal tender currency in Malawi.
- b. To act as banker and adviser to the Malawi Government.
- c. To maintain external reserves so as to safeguard the international value of the Malawi currency.
- d. To promote a money and capital market in Malawi.
- e. To act as lender of last resort to the banking system.

- f. To supervise banks and other financial institutions and,
- g. To collect economic data of the financial and other sectors for research and policy formulation purposes.

Several departments carry out the various functions of the bank in order to achieve institutional effectiveness. The core departments of the bank include; Capital markets and microfinance, Pensions and insurance supervision, National payments systems, Communication & protocol, Procurement & stores, Protective services, Bank supervision, Banking, Administration services/HR, Accounting & finance, Currency management, Foreign flows monitoring, Financial sector regulation, ICT, Research and Statistics (RBM Manual). Therefore, the broad aim of implementation of Oracle ERP was to provide an integrative platform that enhances productivity.

In 2012 the bank adopted Oracle Enterprise Systems (OERP) with the overall aim of increasing efficiency and thereby ensuring increased productivity of all functional units (Chipeta, 2014). This involved discarding the previously used outdated legacy systems that were largely manual.

3.5 Population of the Study

The study targeted workers at the Reserve Bank of Malawi. The workers or employees were specifically those who use and interact with Oracle ERP systems across the 14 departments of the bank. The range of respondents was from senior to junior officers.

3.5.1 Sampling

The sample for the study was drawn from a population of 60 active users of Oracle ERP at the Bank. Thus knowledge of the study area ensured effective distribution and

collection of data. The sample consisted of 50 out of the 60 workers who utilize the ERP to carry out their day to day activities which is approximately 84% of the population. The sample was sufficient to infer the results to Reserve Bank of Malawi. This figure was reached not only because it is representative of the population, but also because of its manageability.

3.5.2 Sampling Method

The study employed a purposive or non-probability sampling method. This is a deliberate sampling method that involves deliberate or purposive selection of particular units of the total population (Kothari, 2004). This type of sampling is important as it provides maximum insight and understanding of the study matter. It is useful in situations where a targeted sample is to be reached quickly, and where sampling for proportionality is not the main concern. Specifically, the study employed a homogenous purposive sampling technique as a sample of shared characteristics. Thus the homogenous sample was drawn on the basis of ERP usage. In addition, purposive sampling is also chosen on account of adequately collecting data regarding impact of Oracle ERP on productivity by involving only those connected to the system. The sampling method was suitable for this study as it ensured that only workers who have interacted with both Oracle ERP systems and manual systems at the bank were included in the study.

At the departmental level, 3 to 4 people were interviewed and this included the head of department or the manager with rights to make approvals in Oracle ERP system, and two other users who were randomly selected.

3.6 Data Collection

The study collected both primary and secondary data from the Reserve bank of Malawi. Secondary data mainly describing the situation before implementation of Oracle ERP was collected from reports, books, and other materials relevant to the topic of study. On the other hand, primary data was collected by using self-administered questionnaires and an interview guide.

3.6.1 Questionnaires

The tool employed was semi structured, meaning it used a combination of both open and closed questions in order to capture rich data related to worker productivity by avoiding biasing the questions with the researcher's logic. The survey instrument was administered in person to ensure that the respondents get the instrument, and this approach also had the overall effect of increasing the response rate. Use of a questionnaire involved piloting whereby a pilot questionnaire was tested on a few respondents before fully launching it to all respondents. This ensured that gaps and inadequacies in the instrument were noted and rectified. The questionnaire did not include names of respondents in order to enable them freely express themselves, and the response time was three weeks.

3.6.2 Interviews

Secondly, data was collected using open ended interviews. Specifically, interviews targeted senior managers at RBM. The interviews were conducted on a one to one basis to increase the confidence of respondents rather than group interviews which limit participation of others as they are dominated by a few dominant respondents (Kothari, 2004). This involved the use of structured questions through predetermined questions. Collecting data through this way is good as it allows the researcher to have control over

the line of questioning (Creswell, 2009). In addition, interviews provide an excellent platform for gauging the emotions, feelings and attitudes of respondents. The researcher is also able to clarify questions and concepts to the level of understanding of respondents.

3.6.3 Archival Records

The first phase of the study involved use of secondary data from archival records in form of reports, manuals, charts etc. The data provided insights into the worker productivity situation at RBM before implementation of Oracle ERP.

3.7 Data Analysis

Data analysis involved generation of understanding from collected information. This study utilized both qualitative and quantitative data. The quantitative data was coded and analyzed using the Statistical Package for Social Sciences (SPSS). The analysis resulted to the generation of charts and tables. Qualitative data from the study was analyzed thematically. Thematic analysis involves the extraction of themes from one's data that are used to answer the research questions guided by the literature review and analytical framework used (Bryman, 2016). In this study, thematic analysis involved categorization and organization into themes of both transcripts and interview notes, and thus, helping in answering the research questions.

3.8 Ethical Considerations

All stages of this study ensured great consideration of ethical issues. Ethics are understood as a branch of philosophy that involves systemizing, defending, and recommending concepts of right and wrong conduct (Cresswell, 2009). This study adhered to ethical norms such as knowledge, truth and avoidance of error. To ensure

that the research achieves its goal without compromising the interests of the respondents and the general public, the following ethical principles were observed; informed consent, confidentiality, respect of intellectual property, and honesty.

3.9 Validity and Reliability

Validity is concerned with whether the findings are really about what they appear to be about (Saunders, Lewis, & Thornhill, 2007). On the other hand, reliability refers to the extent to which the data collection techniques or analysis procedures will yield consistent findings (Saunders, Lewis, & Thornhill, 2007). To ensure validity and reliability, this study included all variables related to the study in the data collection instrument. Interviews which are a good, valid and reliable instrument were used. It is more flexible and open enough to give enough information. To verify the instrument, the researcher conducted a pilot testing before fully administering the questionnaires and interviews.

CHAPTER 4

FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter is a presentation of analysis and findings of the study as outlined in the research methodology. The results presented are on the impact of ERP on individual work productivity. The study aimed at exploring the productivity of workers at the Reserve Bank of Malawi with regard to ERP usage and worker productivity. Data for the study was collected through questionnaires, interviews and archival records.

4.2 Demographic Characteristics of Respondents

4.2.1 Gender of Respondents

Out of 50 sampled workers, 29 were males and 21 were females representing 58 and 42 percent respectively. Table 1 below shows distribution of respondents in terms of gender.

Table 1: Gender of Respondents

Sex	Frequency	Percent
Male	29	58.0
Female	21	42.0
Total	50	100.0

4.2.2 Distribution of Respondents by Designation

Questionnaires were given to and interviews were conducted with individuals holding different positions within the Reserve Bank of Malawi. The positions spanned from junior to senior officers as the researcher wanted to get a clear understanding of how ERP systems influence worker productivity at different levels of and the whole Bank in general.

Table 2: Positions of Respondents.

	Frequency	Percent
Director	4	8.0
Manager	12	24.0
Supervisor	4	8.0
Officer	30	60.0
Total	50	100.0

The study tried as much as possible to target workers of the bank who had the experience of both the old legacy and Oracle ERP systems. This was done deliberately in order to draw an accurate picture on the differences between the two systems in relation to their impact on individual worker productivity.

4.2.3 Departments of Respondents

The study also attracted participation of respondents spread from the 14 departments of the bank. The departments have been linked together by Oracle ERP system

Table 3: Departments of Respondents

	Department	Frequency of respondents	Percentage
01	Capital Markets and Microfinance	3	6
02	Pensions and Insurance Supervision	3	6
03	National Payments Systems	3	6
04	Communication & Protocol	3	6
05	Procurement & Stores	3	6
06	Research and Statistics	3	6
07	Bank Supervision	4	8
08	Banking	4	8
09	HR & Administrative Services	4	8
10	Accounting & Finance	4	8
11	Currency Management	4	8
12	Foreign Flows Monitoring	4	8
13	Financial Sector Regulation	4	8
14	I C T	4	8
	Total	50	100

Table 3 summarizes the spread of respondents in accordance with their departments. The study solicited responses from all departments of the bank in order to draw an accurate picture of the impact of ERP usage on individual worker productivity across the whole organisation. From the table above, it can be concluded that ERP systems have an organisation wide span at the RBM.

4.2.4 Qualifications of Respondents

The Study also asked respondents to indicate their highest level of academic qualification. This was done on the understanding that education has a direct influence on the ability to use effectively not only ERP systems but also legacy systems.

Thus education has the overall effect of building required competences necessary for effectively using any system. The expectation is that high levels of education attainment entails effective use of both legacy and ERP systems and thereby high productivity levels. Results of the study show that respondents have different academic qualifications ranging from Malawi School Certificate of Education to masters with the majority of the respondents holding masters' degrees as summarised by the bar graph below.

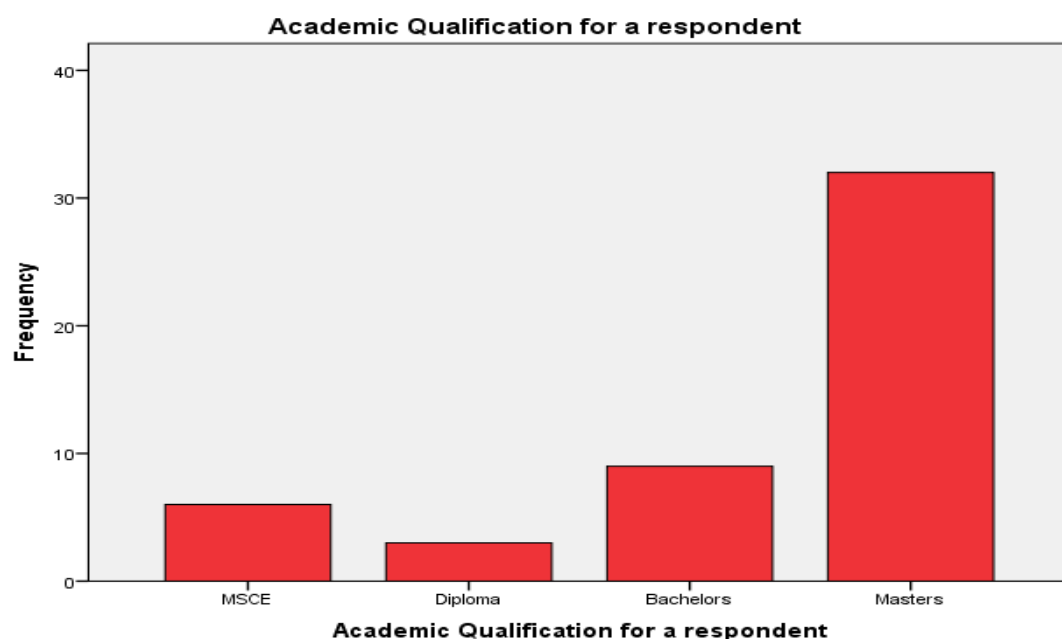


Figure 2: Qualifications of Respondents

The study as illustrated by the graph above showed that 6 respondents have MSCE, 3 have Diplomas, 9 Bachelors Degree and 32 have Masters. It can be concluded that a lot of respondents in the sample have Masters Degree.

4.2.5 Work Experience of Respondents

The study also asked the respondents to indicate the duration for which they had been working at the Reserve Bank of Malawi. Table 3 summarises the findings.

Table 4: Work Experience of Respondents

Years of Service	Frequency	Percentage
10 to 15 years	29	58 %
Above 15 years	21	42%
Total	50	100%

The findings in Table 3 above shows that 58% of the respondents had worked for RBM for between 10 to 15 years, and the remaining 42 % had worked for over 15 years. Therefore, it can be concluded that all the respondents had the required knowledge and experience required to respond to issues related to ERP and legacy manual systems raised by the study.

4.3 Elements of Oracle ERP and worker productivity

The study attempted to find out the various elements of ERP systems that support the work of employees at the RBM. The study observed that informational, data centralisation and, process standardisation are the main elements of ERP systems supporting worker productivity. These elements support a number of sub elements of ERP functions as indicated by respondents such as: Reporting applications, General ledger, Fixed Assets applications, Property management applications, Human Resource Management systems, Order Management systems, Supply Chain applications, Inventory Management systems, Centralised Data Processing, Financial applications, Decision Support applications etc.

Table 4 summarises responses of respondents in relation to ERP elements that are seen as drivers of worker productivity at the Bank.

Table 5: Elements of ERP

	Frequency	Percent
Reporting application	3	6.0
General ledger	5	10.0
Order management system	2	20.0
Process standardisation	10	20.0
Inventory Management System	4	8.0
Information Sharing	15	30.0
Centralized Information System	11	6.0
Total	50	100.0

From the table above, it was observed that elements of ERP that support worker productivity include: Reporting Application, General Ledger, Order Management, Process standardization, Inventory Management, Information sharing, and Centralized Information Systems.

Table 5 above indicates that worker productivity at RBM is largely influenced by informational, and process standardization elements of Oracle ERP.

4.3.1 Information Sharing

Rich and timely information plays a crucial role in ensuring productivity as it presents a myriad of opportunities of effectively executing task, thereby ensuring productivity. All the 50 respondents to the study indicated that the information sharing aspect of Oracle ERP systems impacts positively on their productivity. The study has also revealed that OERP systems complement information sharing through data centralisation. This is unlike the old largely manual legacy systems where data was stored in multiple sources hence hindering retrieval and timely sharing. Oracle ERP systems also facilitate data sharing as they are electronic and this ensures that there is

faster transmission and retrieval of data. This is also in line with a study by Bailey et al (2016) which observed that ERP systems facilitate productivity by providing real-time information, and allowing cross-departmental sharing of common data practices within an enterprise. Therefore, ERP systems can be seen as having enhanced worker productivity at RBM through improved sharing of rich information.

4.3.2 Standardisation of Tasks

The results from the study also indicate that Oracle ERP systems have led to standardisation of tasks at RBM. The tasks in question are those that have to do with; general ledger management, property management, human resources management, order management, supply chain management, inventory management, financial management, and reporting. Standardisation of tasks at RBM has the overall effect of ensuring productivity through improved business agility. Thus ERP has impacted worker productivity through standardisation of tasks at the bank.

This observation is also consistent with existing literature that explains this positive relationship between ERP/work standardisation and worker productivity. For example, the study by Sun et al (2009) concluded that ICT in particular ERP systems improve performance through customisation of processes in accordance with the needs of organisations. Thus standardisation happens as ERP systems are customised to suit idiosyncratic organisational business processes such as human resources management, ledger management etc. Therefore, considering the results in Table 5, standardisation of work activities by ERP systems have resulted in increased productivity of individual workers at the RBM.

4.4 ERP and Task Completion

The study also sought to establish the connection between ERP and task completion. The overriding hypothesis was that technologies like Oracle ERP have the overall ability of enhancing individual worker productivity through enhanced task performance. Thus the study understood task completion in terms of volume of work, as well as time taken to complete tasks.

4.4.1 ERP and Volume of Work

Volume of work also serves as a means of ascertaining worker productivity and overall organisational effectiveness. The study asked respondents to give their views on how ERP affects the volume and ease of work. The focus was on whether: changes associated with usage of Oracle ERP were identified and communicated, productivity measures were clearly defined, there was improved user satisfaction, there is improvement in reporting, there is efficiency in task completion, and if time taken to complete tasks has reduced. In all these factors, results indicate that most respondents are for the positive part for each factor. This implies, among others, that respondents for agree that changes associated with Oracle ERP were identified and communicated within RBM, productivity measures were clearly defined, user satisfaction improved with Oracle ERP, mode of reporting has also improved, just to mention a few. Table below gives views of respondents on whether ERP improves the volume and ease of work.

Table 6: ERP and Work Volume

	Frequency	Percent
strongly agree	21	42.0
Agree	27	54.0
Neutral	1	2.0
Disagree	1	2.0
Total	50	100.0

In the table above, 96% of respondents agreed that indeed ERP improves budget monitoring. 2% of respondents were not decided and only 2% of respondents were against the idea.

The results of the study as illustrated by Table 6 above indicate the impact of Oracle ERP systems on volume of work of individual workers. The impact has been positive as most respondents agreed that the system has resulted to workers registering high volumes of output. The explanation to this phenomenon is attributable to a number of factors, one of which is Business Process Reengineering (BPR). At the bank, BPR has had the overall effect of restructuring work process in the most efficient manner, consequentially culminating to improvements in a number of areas including volume of work. BPR activities as posited in the study of Sobhani (2008) typically concerns the fundamental rethinking and radical redesign of a business process to obtain dramatic and sustained improvements in, among other things, inclusive output.

Thus ERP systems facilitates BPR as it stimulates a thorough revision of the business process and the adoption of new and efficient ways (Rajagopal, 2000). This conclusion is also derived from the study by Kwahk & Kim (2008) which postulated that ERP

implementation requires changes not only in systems but also in processes and other social dimensions. From the responses, it becomes imperative to conclude that ERP systems at RBM have involved changes in the organisation of work process, and roles of workers with a general movement towards automation which has the combined albedo of improving work output. This conclusion is also consistent with the study of Markus & Tanis (2000), which while studying ERP systems in the context of Estonian and Finnish firms noted that the systems acted as mechanisms for enhancing cross functional and interdepartmental operations, and thereby productivity in form of improved output. Further augmentation of this conclusion is provided by the study of Limayem (2006) which noted that forms of ICT like ERP are primary facilitators of quantum improvements like volume of work.

4.4.2 Task Completion Time

Relatedly, the study also attempted to establish productivity of ERP systems on individual workers by focussing on task completion time. The general observation is that ERP systems have led to higher task completion or performance rates. For example, 94% of the respondents were of the view that ERP systems are more efficient in terms of task completion. 4% of respondents were undecided, and the remaining 2% were of the negative view. The table below illustrates the findings.

Table 7: ERP Time of Work Completion

	Frequency	Percent
strongly agree	26	52.0
Agree	21	42.0
Neutral	2	4.0
Disagree	1	2.0
Total	50	100.0

Time of work completion provides an effective measure of individual worker productivity. The study also sought opinions of respondents regarding the effect of ERP systems on task completion time with 94% of them indicating that the systems have shortened processes, and thereby reducing time taken to complete tasks. This is alluded to the automation aspect which is characterised by high processing speeds resulting to fast task completion. For example, one respondent opined in favour of improved work volume by commenting that:

“ERP systems have brought efficiency in time saving by users as processing of transactions is done at their work stations unlike in the past where it required movement across stations”

The positive aspect of ERP systems in relation to reduced time of work completion has support in existing literature. For instance, the study by Powell (1997) concluded that ERP utilizes web based technologies and when successfully implemented, it greatly improves the pace at which transactions are processed. However, some respondents intimated that ERP systems can at times negatively impact task completion time. This is attributable to network problems as the systems are internet and intranet based.

4.5 ERP and Decision Making

Ascertainment of how ERP enhances or facilitates worker decision making is also a critical factor in determining worker productivity. This comes from the realisation that timely and accurate decisions add value to the production function. Some of the factors that enhance worker decision making that were considered by this study are: access to information, rate of excessive bureaucracy in the organisation, distance between management and staff, speed of decision making, quality of decisions. These factors were gauged by using a Likert scale based on a scale of strongly agree to strongly disagree.

4.5.1 Rate of Accessibility to Information for Decision Making

The study wanted to find out the extent to which the ERP has impacted the rate of accessibility to information for decision making. From the table below it can be seen that ERP has improved access to information at RBM. The majority of the respondents indicated that ERP systems have greatly improved access to information for decision making. All respondents agreed that ERP systems have positively impacted on the rate of accessibility to information at the bank by individual workers.

Table 8: Rate of Accessibility to Information for Decision Making.

	Frequency	Percent
Very much	25	50.0
Much	22	44.0
Medium	3	6.0
Low	0	0
Very Low	0	0
Total	50	100.0

25 respondents indicated that the rate of accessibility is very much, 22 responded that the rate of accessibility is much, 3 responded that they have no idea hence medium, representing 50, 44, and 6 percent respectively.

Worker decision making is touted as an important ingredient of productivity. However, it should also be noted that there is a strong correlation between access to information and productivity as information access adds value to the production function. This finding is in conformity with the study by Hitt et al (2002), which concluded that expanded access to information associated with ERP systems in connivance with ability to disseminate timely and accurate information, have an enablement effect of improving managerial and worker decision making. Improved access to information is also a function of the interoperability aspect of the ERP systems which enables different business units of organisation to gather and make information available for usage throughout organisations like RBM. The findings as summated in table 8 above, shows that at RBM, ERP systems have not only increased the ability of the organisation to gather more information in greater detail and in real time, but have also brought about more widespread dispersal of information. This is also in line with the study of Sia et al (2002) which posited that expanded access to information impacts positively on decision making and hence productivity.

4.5.2 Distance between Management and Staff

The study also recognised the role of distance between management and junior staff in decision making and on the worker productivity function. The basic hypothesis is that the shorter the distance the faster and the better is the decision making process and thereby improvement in the worker production function.

The study sought opinions of respondents on whether the ERP has reduced or lengthened the distance between junior workers and Management and how the same has not only impacted decision making but also worker productivity.

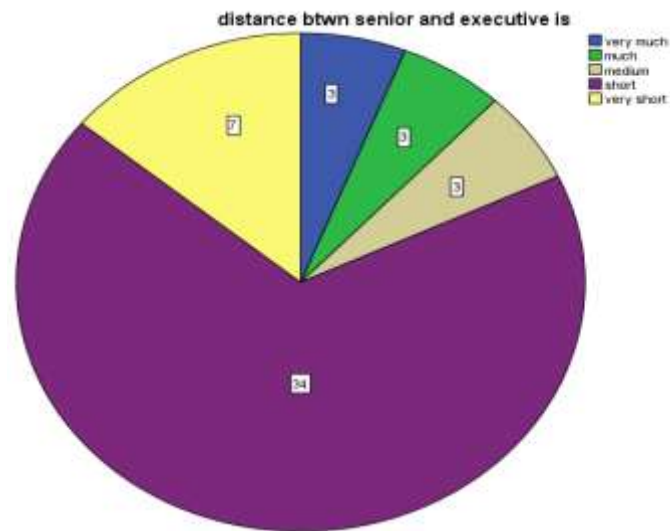


Figure 3: ERP and distance between senior management and juniors

Results as illustrated by the chart above clearly show that out of 50 respondents, 34 indicated that the distance is very short, 7 said that the distance is short, 3 said it is medium, 3 indicated it is much and the remaining 3 respondents indicated that the distance is very much. The most probable explanation to this scenario as reflected by the chart above is that the connectivity aspect associated with ERP systems has reduced not only the bureaucratic distance but also the geographic one. This is the case as junior workers are virtually in contact with senior management and thereby facilitating decision making through provisions of different channels of communication characterised by instantaneous feedback. Thus ERP systems serve as a conduit through which junior workers interact with Management to facilitate decision making.

The second explanation to this result is that technology in form of Oracle ERP has reduced the decision bureaucratic structure at the bank with more and more decisions being made at the point of use rather than from the top of the bureaucratic structure of RBM. From the views of the respondents it can be strongly ascertained that ERP systems have to some extent decentralised the decision making process at RBM. This observation is in tandem with the study of Rajan & Baral (2015) which termed this decision making aspect of ICT like ERP as panoptic empowerment. Thus the panoptic empowerment of ERP systems have resulted to increased speed in decision making meaning that workers including those at the front line are able to make timely decisions and thereby adding value to the productivity function of RBM. This observation is further cemented by Hitt et al (2002) who concluded that ERP systems enable managers to make decisions on current data, whereas individual workers can have greater access to information, enabling increased delegation of authority for production decisions as well as improved communications to customers. Further credence to this observation is provided by the study of Genoulaz (2006) which concluded that ERP systems contribute to organisation productivity by empowering top, middle, and the bottom of the organisation hierarchy.

4.5.3 Quality of Decision Making

The study also aimed at assessing perceptions of respondents in terms of the relationship between ERP use and quality of decisions. This came from the recognition that ability to make high quality decisions is a non-alienable aspect of productive workers. The basic premise is that ERP systems serve as repositories of rich information. Thus respondents were asked to suggest the extent to which Oracle ERP systems affect the quality of task or work related decisions. The graph below

summarizes the views of respondents based on a Likert scale of: very much, much, medium, low or very low quality.

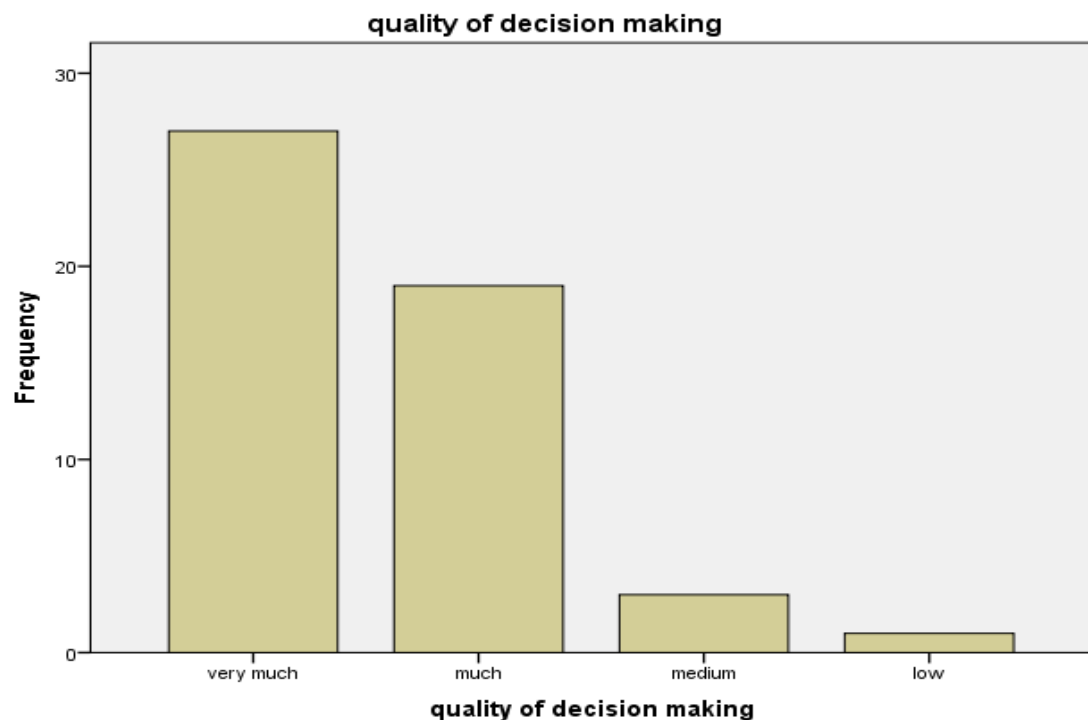


Figure 4: ERP and Quality of Decision Making

From the graph, about 46 respondents indicated that ERP systems have resulted to quality decisions at the bank. The basis of the quality of information associated with ERP system are the increased data storage capacities which stores huge quantities of data of different types. In addition, the integrative aspect of ERP systems facilitates the capturing of data from almost all business functional areas of the organisation. Therefore, it can be concluded that a combination of high quality, accurate and timely decisions have a furthered not only on individual worker but also organisational productivity at the RBM.

4.5.4 Speed of Decision Making

Worker productivity is also a function of not only accurate but also timely decisions. The study also attempted to gauge the impact of speed of ERP systems on speed of decision making and thereby worker productivity in general. This aspect of the study aimed at gauging whether the speed of decision making is faster or slower as a result of use of ERP systems. Table below summarizes the relationship between ERP usage and speed of decision making.

Table 9: ERP and speed of Decision Making

	Frequency	Percent
very much	13	26.0
Much	35	70.0
Medium	1	2.0
very slow	1	2.0
Total	50	100.0

From the table above, it was observed that 96 percent of the respondents indicated that ERP systems have enhanced the speed of decision making a lot; meaning that decision making is much faster now at the bank with ERP. 2 % of the respondents indicated that the speed of decision making is medium, while the remaining 2% of the respondents opined that ERP systems have made the decision making process to be very slow.

Additionally, many of the interviewees also indicated that improved speed of decision making associated with ERP usage was because of the system's ability to capture data and generate reports on real time basis as compared to manual systems which in the past took time to prepare reports.

This conclusion was also drawn by Drey et al (2006) who noted that ERPs lead to improved decision making because of their ability to provide 'real time' information in a variety of report formats, each designed to assist particular management functions and procedures. Increased speed of decision making associated with ERP systems is also attributed to the automation aspect which facilitates fast data; capturing, processing, and also retrieval.

4.6 How Oracle ERP Systems compares to largely manual Legacy systems

One important aim of this study was to draw a comparison between Oracle ERP and manual systems of conducting business at the RBM. The comparison was largely on how the two systems relate to individual worker productivity. The study set out to achieve this objective by delineating important areas of comparison such as: effectiveness in achieving business objectives, effectiveness in improving the level of productivity, performance, labour productivity through automation, presence of excess work and idle personnel, rate of excess, unnecessary or repetition, rate of wastage of resources and task completion. This task was simplified by the fact the majority of respondents had experience of working with both systems as all of them had worked with the bank for over 10 years and thereby in a better position to make reasonable comparisons.

4.6.1 Business Objectives Achievement

This study sought to compare ERP and manual systems by focussing on business objectives of the Reserve Bank of Malawi. The aim was to identify the system that offers effective achievement of the said objectives. This came from the realisation that

effective achievement of business objectives is the core tenet of not only individual productivity but also organisation productivity.

Respondents were asked whether they agree that ERP is more effective than manual as far as achievement of business objectives is concerned. The table below summarizes views of Respondents in line with this objective.

Table 10: ERP and Business Objectives Achievement

	Frequency	Percent
strongly agree	23	46.0
Agree	27	54.0
Total	50	100.0

From the table above, it can be observed that all 50 respondents were in agreement with the proposition that ERP is more effective in achieving business objectives compared to manual system. Results of this research show that ERP systems have more advantages over manual systems in terms of facilitating worker productivity and organisational productivity. It is worth mentioning that findings are also in consistent with the previous study results when it comes to drawing comparisons with manual systems. Apart from perceptions of individual respondents, fulfilment of this research objective was assisted by a review of documents and reports from RBM. This aspect of the research is summarised in the discussion that follows with a focus on two key dimensions which are productivity and rate of inefficiencies.

4.6.2 Level of Productivity

The study also attempted to compare Oracle ERP systems against manual systems by probing opinions of respondents in relation to levels of productivity associated with the two systems.



Figure 5: ERP and Productivity

From the responses of respondents as highlighted by the graph above it was observed that 47 out of 50 respondents agreed that ERP had improved levels of productivity at the bank compared to manual systems. Only 3 respondents were undecided and none were in favour of manual systems.

The study started with a general measure of productivity which involved comparing productivity levels associated with the two systems. This objective involved analysing productivity records of the two systems. On the same aspect, the study also sought opinions of individual workers as summated in figure 5. All 50 respondents to the study indicated that ERP adds more value to individual worker productivity than the largely manual legacy systems. For example, one manager intimated that:

“ERP has improved the operational efficiency of RBM a lot as it has resulted to effective processing of data and performance of tasks by individual workers”.

Another respondent noted that comparably:

“ERP systems have permitted better departmental coordination and enhanced operational linkages within the business or organisational structure of RBM”.

The same views were also echoed by respondents from the HR & Administrative Services department who highlighted that:

“ERP systems have had the overall effect of increasing the productivity of workers as they are accompanied by exciting technologies such as the internet and that because of their user friendliness ”

Further to this, one respondent from Bank Supervision department was also able to summarise the views of all respondents regarding the advantages of ERP systems over manual systems by stating that:

“ERP system usage has resulted to cost reductions and operational efficiency”.

The observations by the all the 50 of respondents to this study are in line with conclusions in some extant literature on the subject of ERP. For example the study by Lozinsky (1998) placed ERP systems above manual systems in terms of reduced operational costs, and improved access to information which is important for more agile decisions. It is imperative to state that increased productivity is associated with ERP systems due to increased collaboration and more streamlined completion of tasks.

4.6.3 Labour Productivity

The study also moved from a general exploration of productivity to a specific one. Thus a comparison between ERP and manual systems was drawn in terms of labour productivity. In this sense labour productivity was ascertained in terms of numbers of workers required to perform specific tasks and also output per person. Results of this observation are illustrated by the table below where out of the 50 respondents, 48 indicated that ERP systems improve labour productivity compared to 2 respondents who favoured manual systems.

Table 11: ERP and Productivity

	Frequency	Percent
strongly agree	22	44.0
Agree	26	52.0
Neutral	0	0
Strongly disagree	2	4.0
Disagree	0	0
Total	50	100.0

Respondents expressed the notion of individual productivity on the basis of the amount of work the systems enable them to accomplish. What was consistent from most respondents is that being productive means assessing the amount of work performed in comparison with work objectives and expected outputs. The general observation under this aspect as represented in table 11 is that ERP has resulted to productive use of labour resources than manual systems. The general consensus is that ERP employs less people to perform specific tasks than the number of people employed to perform similar tasks under the manual environment. The explanation behind this phenomenon is that automation associated with ERP systems negates the need for employing more people.

Similarly, ERP systems result to workers completing more tasks than manual systems and thereby registering high labour productivity.

However, it should also be pointed out that 4% of the respondents were in favour of manual systems. This they noted was due to problems associated with ERP systems such as network errors, limited usage rights, late software updates, lack of system alerts etc.

4.6.4 Presence of Excess Work force and Idle Personnel

The study also attempted to compare ERP and manual systems in terms of the level of inefficiencies associated with the two systems. This was done by putting special focus on the presence of excess workforce and idle personnel. Results in table below indicate that availability of idle personnel and excess work has declined with the use of ERP systems than it was the case with manual systems. All respondents (100%) agreed that ERP has reduced the rate of excess of work force and idle personnel.

Table 12: ERP and Excess/Idle Personnel

	Frequency	Percent
strongly agree	20	40.0
Agree	30	60.0
Total	50	100.0

ERP systems at the RBM have resulted to a significant reduction of inefficiencies like idle or excess personnel. This development can be attributed to standardisation of business processes which allows adoption of efficient or best practices, thereby discarding inefficient ones like those characterised by idle or excess personnel which are common with manual systems. The study findings indicate that since the inception

of ERP systems at the bank, inefficiencies in form of excess work force and idle personnel have significantly reduced.

The explanation to this phenomenon is that ERP systems coupled with the automation aspect are used to perform a myriad of functions unlike in manual systems where there is always danger of over employing people as more are required to perform tasks. This observation is supported by records at the bank which show that some departments have shrunk as the result of ERP usage.

For example, employment records at the bank show that the Accounting and Finance Department had 17 less workers as of June 2016 than the same month in 2009 at the height of manual information systems. Therefore, the probable conclusion is that ERP systems have resulted in rightsizing in terms of the workforce of the bank and thereby resulting to productivity due to a reduction in excess and idle personnel. This observation is further strengthened by the study by Raissi (2017) which concluded that ERP systems require less personnel to process transactions unlike manual systems.

4.6.5 Rate of Wastages and Errors

Wastages of resources and errors in processing are a hallmark of inefficiencies, and hence low productivity. The study also sought to compare Oracle ERP systems and manual systems with a special focus on rate of wastages associated with the two systems. 100% of respondents agreed that ERP systems have reduced the rate of wastages at the RBM.

Table 13: ERP and Wastages

Frequency	Percent
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strongly agree	26	52.0
Agree	24	48.0
Total	50	100.0

The reduction of wastages and errors can be explained in a number of ways. Firstly, ERP is a rich repository of information which results in accurate decisions and hence a general reduction in errors. Secondly since ERP employs automated processes that are not only fast but also have high levels of accuracy, hence there is a general decline of processing errors at the bank.

Respondents intimated that manual processing of information and transactions was riddled with errors before the advent of ERP systems at the Bank. Another pivotal objective of implementing ERP systems at the RBM was to reduce wastage of resources. This came from the realisation that manual systems had high rates of wastage of resources i.e. too much use of stationery, hence ERP systems were viewed as a panacea to the problem. This is the case because most of the ERP processes and transactions are electronically performed, hence it means that wastage of resources like stationery is also reduced.

4.6.6 Rate of Work Repetitions

Ineffective and unproductive systems are also characterised by high rates of repetition of work, and this study also attempted to compare the two systems on this angle. Respondents were asked to compare the two systems in terms of rate of task repetitions associated with the two systems. All respondents (100%) indicated that ERP systems have a low rate of task repetition than manual systems. The table below summarises the

responses of study participants with 54% strongly agreeing, and the remaining 46 % just agreeing.

Table 14: ERP and Work Repetitions

	Frequency	Percent
strongly agree	27	54.0
Agree	23	46.0
Total	50	100.0

The reduced rate of repetition of work at RBM is attributed to improved process efficiency associated with the systems. That is ERP systems have a standardised way of handling transactions which has reduced duplications and repetitions which commonly characterise manual systems. The systems are flexible and designed to enhance productivity by means of elimination of both perceived and emerging inefficiencies such as work repetitions or duplications. This observation is also in line with findings in existing literature. For instance, the study by Chipeta (2014) attributed the decline in repetitions to use of better controls associated with ERP. The controls in question provide enhanced elimination and monitoring of work repetitions and thereby fostering productivity.

4.7 Chapter Summary

The purpose of this chapter was to present and discuss the key findings of this research. The chapter begun with a presentation of demographic characteristics of respondents. This was followed by a discussion of findings relating to the impact of ICT on individual worker productivity at the RBM. The results of the research as discussed

above show that Oracle ERP enhances individual worker productivity through informational elements, improved task completion, and decision making. The discussed results are a strong confirmation of the conceptual model of this study which is an adaptation of Leavitt (1965) diamond organisation model. Thus a change in technology at RBM in the form of ERP has corresponding effects including the improved individual worker productivity. The chapter has also demonstrated that ERP systems add more value to individual worker productivity than manual systems of information organisation and task performance.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter is a summary of the findings and a discussion from the study. The chapter will further draw conclusions and make recommendations regarding the impact of Oracle ERP on individual worker productivity at the Reserve Bank of Malawi. A presentation of the limitations surrounding this study will also be made

5.2 Summary of the Findings

The aim of this study was to assess the impact of Oracle ERP on individual worker productivity at the Reserve Bank of Malawi. In pursuit of this objective a case study approach was adopted where respondents from across the 14 departments of the bank were targeted purposively.

The findings have explicitly revealed that the majority of the respondents agreed that to a large extent the implementation and usage of ERP systems have improved the individual productivity of workers. The study has revealed that ERP systems at the bank are able to influence worker productivity through their efficient information storage, processing and retrieval, and through work standardisation. These informational elements of ERP that have impacted task performance positively relate to: reporting applications, centralisation of information, property management systems, human resource management systems, order management systems, supply chain application,

inventory management system and others. These findings are also in line with the study of Sobhani (2008) who noted that ICT/ERP investment not only makes positive contribution to productivity, but its return is also higher than non ICT investments.

The study has also shown that the influence of ERP systems on worker productivity at the bank is also reflected by increased volumes of work at the bank. This means that the technologies have an enabling effect on volume of work whereby output of individuals has been positive since the inception of the systems. This phenomenon has been attributed to the automation and standardisation aspects of the system that have resulted to improved volumes of work output. Decision making which is also a factor of individual productivity has also improved with the implementation of the ERP systems at the bank. This observation is also in agreement with conclusions drawn by the study by Smith (2008) which concluded that decentralisation in decision making due to technology increases productivity. Improved productivity of the ERP systems, has also been reflected by reduced rate of inefficiencies in comparison to manual systems.

5.3 Conclusion

The study has found that the implementation and usage of Oracle ERP systems at the Reserve Bank of Malawi has had a significant impact on individual productivity of workers. From interviews with personnel at the bank, and from analysis of archival records, the study has ascertained that improved productivity has been stimulated by the informational elements of the systems key to which are centralisation, effective processing and retrieval of information. Productivity gains in question are also in part due to efficient usage of not only financial resources but also human resources.

Improved worker productivity at the bank has further been necessitated by improved decision making and also a general reduction in inefficiencies such as rate of: idle personnel, wastages, errors, work repetitions etc. Therefore, one impact area of Oracle ERP systems at the Reserve Bank of Malawi is crystallized in perceived productivity improvement of individual workers.

5.4 Recommendations

In order for organisations like the RBM to yield full benefits of ICT systems like Oracle ERP the study presents the following recommendations:

5.4.1 Need for Training

The sentiments that came from many respondents were that of productivity gains associated with Oracle ERP systems could be enhanced with appropriate training. The realisation is that effective usage of the systems demands building of appropriate competences that can only be imparted among users through training. Further, the need for continuous training was also noted in the sense that the ERP systems are continually evolving as characterised by periodic updates and thereby requiring continuous training on the part of users to effectively use the systems.

5.4.2 Need for ERP System Analysis

The study also recommends a detailed analysis of the system to ascertain the level of performance against the set objectives of system adoption. This analysis would help in understanding if Oracle ERP systems are satisfying implementation or adoption objectives. The analysis would also reveal system gaps and thereby appropriate remedial action would be undertaken with the overall effect of enhancing the system.

5.5 Recommendations for Future Research

The study explored individual worker productivity of workers at the Reserve Bank of Malawi with regard to use of Oracle ERP. This was done in order to address the gap at the micro level of the financial sector.

However, there is need to replicate the study at the macro level in this case at the banking industry level. That is the impact of OERP systems should be gauged at the industry level not only in Malawi but also at regional level. This is coming from the understanding that the majority of banks in Malawi and in the wider Africa region have not only adopted such systems, but are also interconnected. This would help in drawing a general picture on how ERP systems impact individual workers' productivity not only in the financial sector of Malawi but also the whole African region.

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APPENDICES

Appendix 1: Questionnaire

Dear Respondent

The purpose of this questionnaire is to collect information that will help inform academic research on the impact of information technology (Oracle Enterprise Resource Planning) on worker productivity at the Reserve Bank of Malawi.

I am interested in you as an employee of the RBM working using the above mentioned technology. Please help us by answering the questions as completely and honestly as possible. If possible return the questionnaire by 30th April, 2019, and please note that I am thankful of your time and willingness to complete this questionnaire.

Confidentiality

At the start of the questionnaire I ask for your name and contact details so I am able to get in touch in the future for follow up questions

All survey responses are confidential and will be anonymised for any future uses, such as in publications. The information collected will only be accessible to the researcher and will be stored securely and processed in accordance with the Malawi Data Protection Act.

Before going further, please answer the question below:

I am happy to take part in this survey (tick one) Yes [_____] No [_____]

Best Regards

Mtendere Zita Magola

Respond by ticking or filling in responses where appropriate

Part A: Background information

1. Age _____ Sex ☐ Male ☐ Female

2. Indicate your highest Level of Education

MSCE ☐ Diploma ☐ Bachelor ☐ Master ☐ Phd ☐

3. How many years have you worked for the Reserve Bank of Malawi?

1 – 10 years

10 -20 years

over 20years

☐
☐
☐

4. What section/department of the Reserve Bank are You working for

5. Please state your designation

Director ☐

Manager ☐

Supervisor ☐

Officer - below ☐

Part B: Elements of ERP that support worker productivity

1. What IT device(s) do you use in your work

	(Tick here)
Mobile phone	
Desktop computer	
Laptop	
Tablets	

Others

specify _____

2. How much time on daily basis do you use Oracle ERP?

0 -2 hours ☐

3-4 hours ☐

5-6 hours ☐

7-8hours ☐

Over 8 hours ☐

3. On a scale of 1 to 10, how do you assess your level of competence in using Oracle ERP

1	☐	6	☐
2	☐	7	☐
3	☐	8	☐
4	☐	9	☐
5	☐	10	☐

4. Which of the following elements of ERP that support your work (tick where necessary)

Reporting applications	☐
General Ledger	☐
Inventory Management System	☐
Information sharing	☐
Centralised Information System	☐
Any other elements-	

5. How does ERP elements listed in (4) above support your work

Part C: Extent to which ERP has affected task completion at RBM

1. Expected productivity changes associated with usage of Oracle ERP were identified and communicated.

Strongly agree	☐
Agree	☐
Neutral	☐
Disagree	☐
Strongly disagree	☐

2. Productivity measures were clearly defined

- Strongly agree ☐
- Agree ☐
- Neutral ☐
- Disagree ☐
- Strongly disagree ☐

To what extent do you agree that ease of work has improved due to use of Oracle ERP. (1=strongly agree, 2 = Agree, 3 = neutral, 4 = disagree, 5 strongly disagree)

		1	2	3	4	5
3	Increased user satisfaction					
4	Improved of reporting					
5	Improved budget monitoring					
6	Better communication between functions					
7	Increased efficiency in task performance					
8	Quality of work has improved due to ERP usage					
9	Oracle ERP has reduced the time taken to complete tasks					

10. In what other ways has ERP affected volume of work?

11. In what other ways has task completion time affected by use of ERP?

Part E: ERP and decision making

12. Oracle ERP improves the process and content of decision making

Strongly agree ☐

Agree ☐

Neutral ☐

Disagree ☐

Strongly disagree ☐

13. Employees at RBM are empowered to make decisions by the use of Oracle ERP

Strongly agree ☐

Agree ☐

Neutral ☐

Disagree ☐

Strongly disagree ☐

14. Oracle ERP has resulted to worker satisfaction

Strongly agree ☐

Agree ☐

Neutral ☐

Disagree ☐

Strongly disagree ☐

To what extent do you agree that the use of Oracle ERP has improved decision making. (1= very much, 2 = much, 3 = medium, 4 = low, 5 = very low)

		1	2	3	4	5
15	The rate of accessibility to information for decision making is					
16	The rate of forms, reports and excessive bureaucracy in the organisation is					
17	The distance between senior managers and executive managers is					
18	The speed of decision making is					
19	The quality of decisions has improved					

Part F: How ERP compares to old manuals systems

20. ERP has increased task completion rate than manual systems

- Strongly agree ☐
- Agree ☐
- Neutral ☐
- Disagree ☐
- Strongly disagree ☐

21. In Your opinion the rate of wastage of resources have reduced

- Strongly agree ☐
- Agree ☐
- Neutral ☐
- Disagree ☐
- Strongly disagree ☐

22. The rate of excess, unnecessary or repetitions in the organisation have reduced

- Strongly agree ☐

- | | |
|-------------------|--------------------------|
| Agree | ☐ |
| Neutral | ☐ |
| Disagree | ☐ |
| Strongly disagree | ☐ |

23. The rate of the presence of excess work forces and idle personnel in the organisation has reduced

- | | |
|-------------------|--------------------------|
| Strongly agree | ☐ |
| Agree | ☐ |
| Neutral | ☐ |
| Disagree | ☐ |
| Strongly disagree | ☐ |

24. ERP is more efficient in terms of task performance than manual systems

- | | |
|-------------------|--------------------------|
| Strongly agree | ☐ |
| Agree | ☐ |
| Neutral | ☐ |
| Disagree | ☐ |
| Strongly disagree | ☐ |

25. ERP improves productivity of labour through automation

- | | |
|-------------------|--------------------------|
| Strongly agree | ☐ |
| Agree | ☐ |
| Neutral | ☐ |
| Disagree | ☐ |
| Strongly disagree | ☐ |

26. ERP has improved levels of productivity than manual systems

- | | |
|----------------|--------------------------|
| Strongly agree | ☐ |
|----------------|--------------------------|

- Agree ☐
- Neutral ☐
- Disagree ☐
- Strongly disagree ☐

27. ERP is more effective for achieving business objectives than manual systems

- Strongly agree ☐
- Agree ☐
- Neutral ☐
- Disagree ☐
- Strongly disagree ☐

28. In what other ways does oracle ERP compare with the old manual systems

29. In your opinion what are some of the work related challenges that have come with the use of ERP?

30. How best can the challenge(s) be addressed

END OF QUESTIONS

THANK YOU FOR YOUR RESPONSES

INTERVIEW GUIDE

1. In your opinion what are some of the changes in worker productivity as a result of implementation of ERP
2. How does worker productivity compare before and after implementation of ERP
3. What elements of ERP have greatly impacted worker productivity
4. How has the ERP system affected
 - a. Volume of work
 - b. Task completion time
 - c. Worker decision making
5. What are some of the major challenges associated with ERP
6. How have those challenges impacted on worker productivity
7. In your opinion how can the challenge(s) be addressed
8. What areas of the system needs modification to enhance
 - a. Worker productivity
 - b. Organisation efficiency

Appendix 2: Letter of Authority



Principal
Prof. Richard Tambulasi, BA (Pub Admin), BPA (Hons), MPA, Ph.D

Our Ref: PA/I/I
Your Ref:

CHANCELLOR COLLEGE
P.O. Box 280, Zomba, Malawi
Telephone: (265) 01524 222
Fax: (265) 01524 046
Email: principal@cc.ac.mw

Department of Political and Administrative Studies

1st October, 2019

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

LETTER OF INTRODUCTION: MS. MTENDERE MAGOLA (MA/HRMIR/06/16)

The bearer of this letter is **Ms. Mtendere Magola**. She is a student in Master of Arts in Human Resource Management and Industrial Relations programme in the Department of Political and Administrative Studies at Chancellor College.

Our students are required to write a dissertation in order to complete their master's programme. Therefore, Ms. Mtendere Magola intends to carry out a data gathering exercise for this purpose in your office.

Any assistance rendered to her in the course of this exercise will be highly appreciated. Let me also point out that the information gathered will be treated as confidential and purely for academic purposes.

Yours faithfully,

M. Chasukwa, PhD
HEAD OF DEPARTMENT

MC/ck