

**HOW MANAGEMENT OF IS PROJECTS IMPACT QUALITY AND NET
BENEFITS OF BUSINESS SYSTEMS CASE OF A MALAWIAN ICT
COMPANY**

MSc (INFORMATICS) THESIS

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**UNIVERSITY OF MALAWI
CHANCELLOR COLLEGE**

JUNE, 2019



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Submitted to the Faculty of Science, Department of Computer Science in partial
fulfilment of the requirements for the Degree of Master of Science in (Informatics)

**University of Malawi
Chancellor College**

JUNE, 2019

DECLARATION

I hereby declare that the text of this thesis titled ‘Evaluating How Information System Projects Affect quality of Business Systems and Expected Net Benefits’ is substantially my own original work which has not been submitted to any other institution for similar purposes. Where other people’s work has been used, it has been properly acknowledged.

ROBERT BRIGHTON CHIMALIZENI

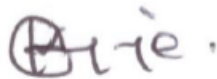
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CERTIFICATE OF APPROVAL

We, the undersigned certify that this thesis represents the student's own work and effort and has been submitted with our approval. We recommend to the Postgraduate Studies and Research Committee and the Senate for acceptance of this thesis titled "Evaluating how information system projects affect quality of business systems and expected net benefits" submitted by Robert Chimalizeni in partial fulfilment of the requirements for the degree of Master of Science in Informatics.

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DEDICATION

Dedicated to the memory of my late mother Jessie Njobvuyalema-Chimalizeni popularly known as Anamoyo and her unknown family from unknown Mozambican village. From her I learned how to be resilient and resourceful against all odds.

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I sincerely thank all friends and relatives, who have contributed to my studies and more especially those who have contributed to the completion of this research.

ABSTRACT

To date there is no in-depth analysis and better understanding of cause and effect relationship among IS project management, system quality and net benefits in private sectors of developing nations. This research addresses this gap. This is a qualitative case study research with an explanatory and empirical approach. The data for the study was collected from purposive sample of 60 employees drawn from a Malawian ICT based company, using semi-structured interviews augmented by document analysis. The study's key findings even though not confirmatory reveal that there is a causal relationship among the conduct of implementing IS projects, the quality of the systems that come out of IS projects and the expected individual and group net benefits from the systems. The study also confirms the notion that IS projects are normally challenged and that the challenges in developing nations are more pronounced due to other unique factors like unstable economic environment, corruption and dishonesty. The study further show that cleanliness of data impacts the systems information quality and functionality. The study has limitations that hinged on the information access and unwillingness by research subjects to share vital information and data due to confidentiality concerns.

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LIST OF ACRONYMS AND ABBREVIATIONS

CDMA	Code-Division Multiple Access
CTO	Chief Technical Officer
ERP	Enterprise Resource Planning
EXCO	Executive Committee
ICB	Inter Carrier Billing
IN	Intelligent Network
IS	Information Services/Systems
ISMFF	IT Service Management Forum Finland
KPI	Key Performance Indicators
LTE	Long Term Evolutionary
M & O	Maintenance and Operations
MACRA	Malawi Communications Regulatory Authority
MPLS	Multi-Protocol Label Switching
MTL	Malawi Telecommunications LTD
NGN	Next Generation Network
OCS	Online Charging System
PAT	Project Acceptance Testing
PIU	Project Implementation Unit
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
RFP	Request for Proposal
SLA	Service Level Agreements

TDN	Telecommunications Development Network
TELCO	Telecommunications
UAT	User Acceptance Testing

CHAPTER 1

INTRODUCTION

This chapter discusses the background to this study and the study objectives, research questions, justification and structure.

1.1 Background of Study

Information systems development is a project and if the project is properly managed the outcomes are likely to be effective and the opposite is true. Mohan and Ahlemann (2014) in agreement with Nickerson (2001) argue that project management has become a strategic tool used by organizations to achieve business objectives. Mohan and Ahlemann (2014) goes further to state that quality and good outcome systems from information systems projects can be an effective tool in assisting companies to quickly adapt to changing business environment. Zouaghi, and Laghouag (2016) discuss possible benefits from information services projects as better information for more accurate decision making, improved service for both the customers and the employee and improved productivity. Companies have to act with speed in adopting new technology in order to remain competitive in an ever changing and fiercely competitive business environment. Notions from previous research work for example by Shuhab-u-Tariq (2010) show that the management of information system projects is often challenged with technical, human and social factors.

Companies expect returns from the investments in information system projects. However, the key question is: are the business expectations being fulfilled? Research findings by Jern (2009) show that in reality companies often fail to add value to the business from investment in information system projects. Jern (2009) goes further to conclude that the general notion is that investing in information systems is mostly just an expensive endeavour with marginal actual benefits and returns. Researchers in information system projects, for example, Kornkaew (2012) and Al-Mashari, Al-Mudimigh and Zairi (2003) argue that most business entities continue to blindly invest in information system projects in the hope that one day they

will to get it right and achieve the much expected group and individual benefits. The pressure is on both the system vendors to design systems that will suit and benefit the companies and the companies themselves to get successful results from information system projects. It is vital and critical that the implementation of information system projects is properly initiated, planned, controlled, executed and closed so that the outcomes from the projects are beneficial to the implementing entities.

Wognum and Fan (2008) and Wognum, Krabbendam, Buhl, Ma and Kenett (2004) state that it is self-evident that there is need to enhance the knowledge and best practice for implementation of IS projects so that companies can recoup the often huge project investments. Many of the challenges in IS projects are not related to technical issues but rather to the people and the organization. Therefore, it would be wise and desirable to place more effort into social and people factors when implementing IS projects. For example, use the methods of organizational change management to ensure project success.

1.2 Problem Statement

Based on the researcher's extensive literature review to date there is no in-depth analysis and better understanding of cause and effect relationship among conduct of project management, system quality and system net benefits in private sectors of developing nations. Previous research in information systems (IS) projects by groups and individuals, for example, Standish Group International Research (SGIS, 2004), Oracle White Paper (2011) and Shuhab-u-Tariq (2010) focused on challenges encountered during implementation of IS projects and why most of the IS projects fail. Furthermore, past studies were mainly conducted in the public sectors of developed nations leaving a gap in private sectors of developing nations, for example, Malawi. This study also tries to establish the relationship between the cleanliness of data collected and migrated during implementation of IS projects and the information quality and functionality of the business and operational systems that come out of IS projects. This relationship has either been ignored or under-represented in previous IS projects research work

1.3 Objectives of Study

1.3.1 Main Objective

The main objective of this study is to evaluate what is the relationship among the conduct of IS project management, the quality of the systems that come out of the IS projects and the net benefits on a business entity implementing the IS projects.

1.3.2 Specific Objectives

The specific objectives are as follows:

- (a) Identify major IS project challenges likely to impact system quality and net benefits.
- (b) Determine the success factors and rates of IS projects.

1.4 Research Questions

The Main Research Question:

- What is the relationship between the management of IS projects, system quality and the expected group and individual net benefits the systems

The Specific Research Questions are:

- (a) How does the conduct of project management influence the quality of information systems and hence the net benefits accruing from the systems
- (b) What are the benefits of investment in IS projects to the business?
- (c) What are the key issues that need to be identified in order to achieve a successful IS project?

1.5 Justification

Theoretically, the research will generate knowledge that will enable researchers and practitioners to understand project management challenges that lead to failure of IS projects in the developing nations, particularly Malawi, and the consequences of failed IS projects on the implementing entities. Practically, from the generated knowledge it is hoped that business entities will derive lessons learned from the study and implement best practice for future IS projects.

1.6 Central Concepts

The concept of ‘information system (IS) project’ in this thesis refers to a project whose purpose is to introduce an information service in some organization. A project starts with initiation and ends when the end users start using the system. Information systems are defined in detail at the beginning of chapter 2. In this thesis the term “Implementation” is used to describe the whole process of introducing Information system into an organization. The term is defined as “the process that include the Business decision to initiate, plan, execute, control and close IS projects and deploy the outcome systems for operational use” (Zhang, Lee, Huang, Zhang, and Huang, 2005, p. 56). In this thesis, the term ‘outcome systems’ refers to the business and operation systems that emerge from the implementation of information system projects. The term ‘net benefits’ refers to the group and individual benefits that a business entity expect to accrue from the investment in information system projects. The benefits could be financial, commercial, technical, human or social. The word ‘impact’ is used in the sense of ‘influence’ and usually in the long term and profound while ‘Effect’ is a change which is a result or consequence of an action or other cause. Effect is used in the sense of ‘result’.

1.7 Structure of Thesis

The remainder of the thesis is arranged as follows:

Chapter 2 reviews existing knowledge and critiques work on similar subject by other researchers. The chapter presents the conceptual framework and reviews literature on IS projects. Chapter 3 outlines the methodology, strategy and approaches that were used in conducting this research. It mainly shows how the sample was chosen, how the data was collected, analyzed and interpreted. The chapter also discusses the instruments used and how measurement was done. It also shows how contemporary issues in research, especially ethical consideration, were approached. Chapter 4 is a Case Description of the Case Study IS projects, it shows the context in which the study was done. Chapter 5 presents results of the study based on data collected and conceptual framework and discusses the results. Chapter 6 concludes the study and makes recommendations.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature about the management of IS projects, quality of the systems that come out of IS projects and the net impact of IS projects on the entities that implements IS projects with particular interest in business world. The chapter also discusses theories that form a theoretical framework for discussing findings of this study. The literature review mostly covers the period between 2005 and 2016 but also includes some between the period 2000 and 2004.

2.2 Nature of Information Systems Projects

Information Systems (IS) is a set of related components consisting of hardware, software and people working together to achieve specified objectives (Laudon and Laudon, 2007). According to Stair and Reynolds (2010) using information systems requires an understanding of people, technology and management. Hevner and Chatterjee (2010) observed that investment in information systems has become a bigger portion of overall capital investment for most businesses. Information systems play a vital role in operations, enterprise corroboration, management and strategic success of a business. Information Technology (IT) is the use of any computers, storage, networking and other physical devices, infrastructure and processes to create, process, store, secure and exchange all forms of electronic data (Silberschatz and Abraham, 2010).

Projects are temporary effects to create unique products or services thus they require effective management of resources (Chapman, 2010). Projects often involve people who work in collaboration towards a common goal. The objective is to meet a set goal in a timely and effective manner. The project activities performed by the people are often interrelated. All

projects hold a degree of uncertainty and it is common to encounter problems throughout the lifecycle of a project (Shuhab-u-Tariq, 2010). Additionally, IS projects are technical in nature and technical projects do not occur in isolation from the rest of the organization's business activities, its customers and the broader environment (Isfahani, 2011). They are not only technology projects but also business projects that require additional skills beyond knowledge of technology. It also demands business knowledge of the application domain in which the projects are being implemented. If not considered in their entirety IS projects are likely to fail.

2.3 Impact and Effects of Information Systems on Net Benefits to Business

Information systems overall have great impact and effects on organizations, both internally and in their relationship with other organizations (Kornkaew, 2012). Large information systems may actually often influence ways of working and hence shape the business processes. Companies where IS and IT which were embedded in them, do not only affect internal actors, but also external stakeholders (Davies, 2009). For instance, IS can change relationships between individuals and departments within the organisation and also affect some relationships outside the organisation for example with customers, suppliers and clients (Lucey, 2005). Technologies have a significant effect on the structure of the organisation. Technologies allow people to change their place of work, improve working practices, reduce marketing and transaction costs, coordinate the flows of organisational information, have closer contact with customers, suppliers and clients and have an impact even on the organisation's structure and culture (Lucey, 2005). Over the past few decades, companies all over the world started to notice a great need for information systems in the business field. It was therefore not possible to ignore the significance of benefits and a possibility to increase business performance through such an investment. It was quickly observed that an IS can help a business to save money, increase the competitive advantage and improve performance, thus creating more profits (Lipaj, Dmitrij and Davidavičienė, Vida, 2013).

To deliver genuine benefits, information systems must be built with a clear understanding of the organization in which they will be used. There must be consideration of the firm's environment, structure, culture, politics, organization and leadership, business processes, as well as the principle interest groups affected by the system. Alignment between information

systems and business is a top research issue (Aversano, Carmine Grasso, and Tortorella 2012). These scholars demonstrated through case studies, surveys and empirical evidence that information systems and technology are closely connected.

Business enterprises cannot be competitive if their information systems and business strategies are not aligned. In the opinion of Leonard and Seddon (2012) information systems managers consider IT alignment to be a key issue for their organizations. IT alignment continues to be the first top management concern for executives in organizations around the world. Strategic alignment of information systems exists when goals, activities and business processes are in harmony with information systems that support them (Kappelman, Johnson and Torres, 2016). New information technological developments put new demands on companies or provide new opportunities for developing or improving market activities as well as products and services (Lindh, 2009). Some researchers for example Mabert, Soni and Venkataramanan (2003) suggest that information technology increases business process and relationships efficiency. However, other researchers for example Green and Cameron (2009) say there is negative impact of information technology and that information systems only give a company a competitive advantage if the organization has enough competences to get the most out of the systems. Green and Cameron (2009) go further to argue that that information systems are no longer a rarity so they do not give a company a real competitive advantage.

An investment in information systems is a large investment and companies expect to gain a lot from the implementation of IS projects. It is therefore natural that a company should perform a project review and appraisal post project implementation to evaluate if the IS project brought in financial benefit or other form of improvement. However, findings by ISMFF (2017) show that about one third of organizations do not have formal methods of evaluating IS investments and that most organizations use ad hoc and informal methods to evaluate success of IS investment because either the measures are lacking or problematic.

In summary information systems among others can have the following tangible and intangible benefits on a business: (ISMFF, 2017)

- Improved customer services
- Personnel reduction
- Reduced operational costs
- Productivity improvement
- Increased profits
- Improved morale
- Increased user satisfaction

2.4 Project Management and Information Systems Failure

Nauman, Aziz and Ishaq (2003) argue that failure of information systems development projects is no breaking news. Reasons why most projects fail are well documented and yet most projects repeat the same mistakes. According to an often cited report from Standish Group International Research (SGIS, 2012) more than 70 % of technical projects fail and in most industries, the bar of expectation for project success has been lowered. Accepting project failure has become a norm (SGIS, 2012). SGIS categorizes project failure into two sections: completely failed projects that are usually cancelled before completion or are never implemented; and challenged projects that are completed and are operational but are over budgeted, over scheduled and offer less features and functions from the original requirements and objectives.

To understand project failure, you will have to understand the three fundamental principles of project management which are (SGIS, 2016):

- i. Context Principle; much as IS projects are technical in nature however they occur in a broader context, it is more than the technology and it includes business and society.
- ii. Entropy Principle; the amount of disorder in a IS project will not by itself disappear with time, it requires carefully planned organization of project management function.
- iii. Society Principle; Technical projects are social undertakings where people management skills and motivations are key.

Results of five different surveys from different years 2001, 1997 and 1995 from developing countries concluded that (Nauman et al., 2003):

- IS projects are more likely to be unsuccessful than successful;
- About one out of five IS projects are likely to bring full satisfaction;
- The larger the IS project the more likely the failure; and
- Forty (40%) of projects failed to achieve their business case within one year of going live.

Managing projects in the Telco Industry requires ability and excellent knowledge of project management. Project Managers (PM) have to manage and control work execution while wave rolling planning projects, analyzing new constraints and requirements, compressing time and costs. Team management is time consuming and efficient communication between distributed stakeholders is required. Project Managers in the Telco Industry today are called to face tough times. Strong competition among operators forces business strategy changes, goal shifts, compelling search for competitive advantages (new technologies, new services and offerings while reducing time to market. This means sudden turnarounds in strategies, project scope swings, variations in constraints and shifting project milestones. In this precarious context, driving successful projects requires flexibility, thinking forward attitude and a handy knowledge of advanced project management methodologies. PMs in the Telco industry should, therefore, combine traditional and expert techniques, such as change management, stakeholders satisfaction, virtual teams management and, of course, scheduling and cost compression. Efficient communication is mandatory in order to guarantee the alignment between all the stakeholders and the team and to monitor early warnings of issues and/or scenario changes (Ludovico and Petrarca, 2010).

2.5 Common Challenges of IS Project Management

Previous research findings by various research groups and individuals for example CHAOS (2014); Oracle White Paper (2011) and Shuhab-u-Tariq (2010) agree that IS projects fail because of project management challenges thereby compromising quality of the IS project outcomes. Among some of the common project management challenges discussed in details below are : poor project identification, lack of proper planning and standard methodologies,

incorrect project estimates, lack of skilled staff and executive management support, unclear requirements and the lack of collaborative effort and communication.

Poor Project Identification is cited as one of the major challenges. Identification of IS projects should be done by a stakeholders group and be driven by the technical and financial viability of the project. The projects identified can be 'Top-Down-Source', identified by top executive management or 'Bottom-Up-Source', identified by user departments. Several projects should be considered, classified and ranked and a stringent selection process based on measurable factors employed (Hoffer, George, and Valacich, 2011). Sometimes sponsors and champions of IS project may select projects for implementation due to current trends in the industry or as pet projects where they have vested interests. Such projects are likely to be a waste of resources because there is no value addition to the business and are unrelated to the business strategy and goals (Bradley, Ellie, Laraichi, Oussama, Ryan, Mark, Tripathy, Sudipta, Van DerSchaaf, Hans, Daim, and Tugrul, 2017).

The lack of proper planning and standard methodologies is another challenge. Large sized projects with overambitious scope, budget and schedule that place unrealistic expectations on the project as one major reason for project failure. Poor planning from project managers sometimes is due to time pressure from senior management to start implementation before project is properly defined (The New Zealand Project Management Survey, 2013). This agrees with findings by Fichter (2003) who argue that executive management sometimes view project planning as a waste of time therefore fail to plan on prioritization of allocation of resources and act on intuition leading to project failure. The absence of a proper level of detailed plan/schedule for individual action steps can bring chaos and lack of direction in a project (Fichter, 2003). Overlooking the use of standard project methodologies and automated tools for example PMBOK and PRINCE2 that are organization-specific as one key cause of IS project failures (Oracle White Paper, 2012). The Oracle White Paper (2012) further suggests that projects methodologies should be used in combination with more governance-oriented frameworks like ITIL and CoBiT.

Estimation mistakes in time, cost, effort and resources required to successfully implement a project creates project related problems. Another common mistake related to estimation is making linear estimations when estimating schedule, for instance assuming that increasing staff on a project will automatically improve and increase project productivity (Taimour, 2005; Grossman, 2005). Risk management plays an important role within project management. A reactive approach as opposed to a pro-active approach in identifying, analyzing, assessing and mitigating the impact of project risk may seriously impact the project environment (Passenheim, 2009; Shuhab-u-Tariq, 2010). Objectives change during a project and a project team must be able to adapt to the changing business and user requirements. Frequent changes to project objectives may result in a project becoming more complex and large in size and scope. If the project team stays committed to the original requirements and are not aware of differences between original requirements and new requirements the project can be headed in the wrong direction (Kerzner, 2012)

IS projects require a skilled team that has knowledge of both hardware and software technologies. Due to rapid growth in knowledge and constant change in technology, it is difficult to know what kind of skilled people will be required for the project. Another skill problem is that people with experienced technology skills may not necessarily have other required skills for a project like planning, organization, communication and oversight (Glaser, 2004). The lack of executive management support is catastrophic because it means the project may be starved of required resources more especially if the project is lengthy and complex. Current management may not be around to see through completion of the project and any new management team may take a different view of the project or priorities of the organization may change to a point where cancellation of the project is in line with the new priorities (Ewa, 2013; Glaser, 2004; Isfahani, 2011; Jenster and Hussy, 2005).

Unclear, incomplete and inaccurate requirements are examples of early life cycle errors that impact on projects' success. Unclear requirements happen due to poor requirements gathering during the definition stage of project and too many unclear goals and objectives for the project. Unclear requirements may also come due to pressure from top management to execute a project before the project scope is thoroughly defined (Glaser, 2004; New Zealand Projects Management Survey, 2013).

No single person has a complete and overall view of a project. Projects might fail due to lack of collaborative effort, involvement and effective communication among all key stakeholders. Communication fail to take place because IS projects are usually complex and involve a lot of analysis and work, such that the team is too busy to communicate and executive management sees no visible progress. Breakdown in communication makes it impossible for all parties to clearly understand the project requirements leading to an abstract project evolution (Čulo and Skendrović, 2010). Users who will eventually use the product have a better perspective of the design of the product hence the cost of failure to recognize this important fact is high. When users are sidelined in IS Projects the end product may be rejected by the users because the product does not satisfy requirements as understood by the users or the requirements are no longer valid due to changing business and user requirements. If users are not involved early in the requirements gathering process, errors will be discovered later by the users during the development process. It is more costly to correct errors later in the development process. Instead of building the system the development team will be solving user problems. User preparation which includes training and change management if not properly done may lead to project failure (Van Vliet, 2007).

2.6 Managing and Sustaining Information System Projects

Today's projects implementers need to be attuned to the cultural, organizational and social environments of the project when conceptualizing. Understanding this environment includes identifying the project stakeholders and their ability to affect successful outcome of the project. This means working with people to achieve the best results and therefore there is need to understand their cultural, organizational and social surroundings. Understanding cultural, organizational and social surrounding leads to the possibility of influencing the project environment in a positive way and better reception of the change which the project is designed to introduce and also sustain the project (Barron and Barron, 2013)

Sometimes people are not given responsibility to drive project management or project manager simply has poor leadership qualities to drive a project. A project manager sometimes fails to translate the project sponsor strategy into tactics. They fail to conceive, manage, monitor and control a project to ensure project outcomes are delivered efficiently (DeMarco and Lister, 2013). Projects that are not disciplined with coordinated training and active human resource department involvement risk failure. The project manager should be

competent and experienced. The project team members should be people with complementary skills or else the project will face management challenges. If the project team is not co-located, it will be difficult for the team to work together and support each other (DeMarco and Lister, 2013). A project manager who fails to consistently apply methodologies, hold team members accountable for their actions, maintain the project momentum, harmony and rhythm will not succeed (Barron and Barron, 2013; Heuvelhof, Veeneman, and Voort, 2010; Isfahani, 2011; Leijten, Koppenjan, Heuvelhof, Veeneman, Voort, 2010). A project manager should have people skills to realize and act on three dimensions of leadership and management skills which are personal, team and collaborative dimensions. Team members are individuals and they need to be recognized for their contributions. A project team is more than a collection of individuals, it is an entity on its own and needs to have its own rhythm. The project does not end with team members only but it should consider all the stakeholders and society at large (Barron and Barron, 2013; Leijten et al., 2010).

Sustainability is the ability of a project or intervention to continue its existence after the implementing agency has handed over project to client. Once projects have been deployed, one of the major challenge is the sustainability of these projects. There are various dimensions of sustainability. Among some of these is economic or financial: The long-term ability of ICT projects to generate adequate income to meet their operational and maintenance costs; Social: addresses social concerns, involve local actors, impact social structures. Technological: the long term availability and durability of the technology without recourse to major changes in hardware or software; Institutional: Linked to social sustainability but mainly focuses on political stakeholders that might affect the project and its viability; Environmental: The use of environmentally friendly equipment and the use of recycling and safe disposal (Sein, Maung, Ahmad, Irtishad, and Harindranath, 2008).

2.7 Models and Theories of Project Management

There are a lot of theories and models which have been used by researchers to assess the adoption, impact, success, sustainability and best practice of project management for information systems. However, there is no one theory or model which is complete and can

assess each and every area. Two main theories to be employed in this research are DeLone and McLean IS Success Model and Project Management Theory.

2.7.1 DeLone and McLean IS Success Model

The DeLone and McLean IS Success Model seeks to provide a comprehensive understanding of IS success by identifying, describing and explaining among six of the most critical dimensions of success (Perez-Mira, 2010). The theory was developed by William H. DeLone and Ephraim R. McLean in 1992 and was later refined by the same researchers after getting feedback from scholars working in same area.

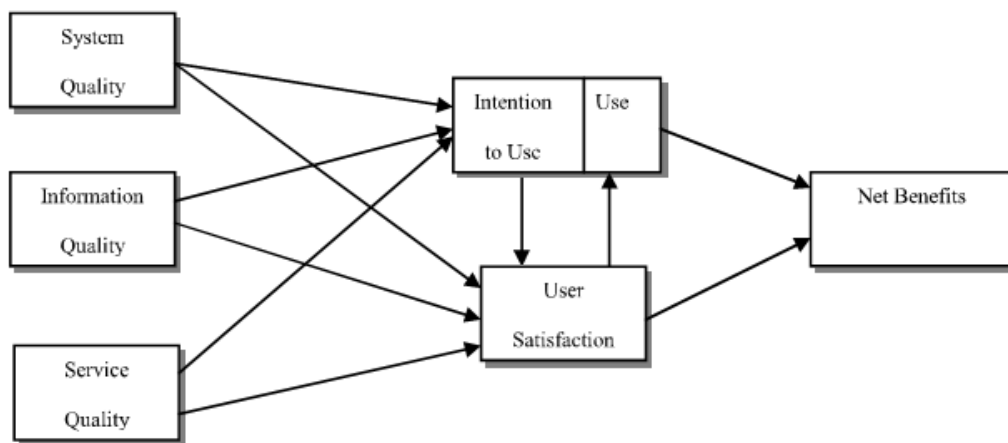


Figure 2.1: Updated IS Success Model (Adopted from DeLone and McLean, 2003)

The six critical dimensions of DeLone and McLean IS Success Model are information quality, system quality, service quality, system use/usage intentions, user satisfaction, and net system benefits. IS quality occupies a very prominent place in IS success models. DeLone and McLean (1992) have identified IS success as a multifaceted construct consisting of quality measures (system and information quality), attitudinal outcomes (use and satisfaction), and performance-related outcomes (individual and organizational impacts).

Information quality refers to the quality of the information that the system is able to store, deliver, or produce (Larry, 2009). Information quality, is a concept that is related to the quality of information system outputs, can be described in terms of outputs that are useful for

business users, relevant for decision making, and easy-to-understand (representing IS quality as value) as well as outputs that meet users' information specifications (representing IS quality as conformance to specification) (Somers, 2010). Information quality impacts both a user's satisfaction with the system and the user's intentions to use the system, which, in turn, impact the extent to which the system is able to yield benefits for the user and organization.

As with information quality, system quality which is the overall quality of a system is also one of the most common dimensions along which information systems are evaluated. System quality represents the quality of information processing itself, which is characterized by employment of state-of-the-art technology, a system offering key functions and features (denoted as IS excellence), and software that is user friendly, easy to learn, and easily maintainable (denoted as IS value) (Luftman, Tal, Dwivedi, Eduardo, 2010). System quality indirectly impacts the extent to which the system is able to deliver benefits by means of mediational relationships through the usage intentions and user satisfaction constructs.

Service quality is defined as the level of service delivered by IS service providers to business users (as compared to their expectations) in terms of reliability, responsiveness, assurance, and empathy. These concepts of IS service quality are reflected through IS meeting user expectations (by satisfying IS users by providing services to users at the time promised, building confidence in IS users, and being courteous to users when dealing with service requests) and demonstrating (Somers, 2010). IS service quality directly impacts usage intentions and user satisfaction with the system, which, in turn, impact the net benefits produced by the system. Service quality has the greatest impact of all three quality constructs, thus highlighting its importance to both internal efficiency and strategic benefits.

Intentions to use an information system and actual system use are well-established constructs in the information systems literature. In the IS success model system use and usage intentions are influenced by information, system, and service quality. System use is posited to influence a user's satisfaction with the information system, which, in turn, is posited to influence usage intentions. In conjunction with user satisfaction, system use directly affects the net benefits that the system is able to provide. User satisfaction refers to the extent to which a user is

pleased or contented with the information system, and is posited to be directly affected by system use. The net benefit that an information system is able to deliver is an important facet of the overall value of the system to its users or to the underlying organization. In the IS success model, net system benefits are affected by system use and by user satisfaction with the system. In their own right, system benefits are posited to influence both user satisfaction and a user's intentions to use the system (Somers, 2010).

Information systems organization impact does not have clear and defined measurable variables. Further, in spite of the vast literature on "IS success models", there has been little or no empirical evidence relating the IS quality variables directly to organizational impact (Somers, 2010). Organization impact measures can be grouped into three areas: Profitability measures, productivity measures and cost/benefit analysis. From the three areas, one or more measures are selected to operationalize organization impact. Among some of the variables used to measure IS impact on overall organization performance are cut or lower costs, productivity gain, problem resolution, increase revenue, market share, sales and return on investment (Kornkaew, 2012)

2.7.2 The Theory of Project Management

The theory of project management will be used in this research to evaluate the current effectiveness and efficiencies of project management process for the case study. The theory of project management emerged from research to formulate theoretical foundation for project management by Howell and Kolskela (2002). Before the theory of project management it was generally seen that there was no explicit theory of project management. With the theory of project management it is possible to precisely point out the underlying theoretical foundation of project management as espoused in the PMBOK by PMI and mostly applied in practice. This foundation can be divided into a (i) Theory of project; where the project is transformed from inputs to outputs by decomposing the project into manageable and well-understood sub-transformations, tasks (ii) Theory of management; the underlying concepts of the theory of project management are Initiation, Planning, Control and Execution.

The purpose of project initiation is to reach a consensus on which project to select. The project initiation process defines the goals, purpose, objectives and resources required to

complete the project. It is a contract between project sponsor and project team. Among the expected deliverables are a project charter, business case, proposed solution and alternative solution. There is a managerial part and an effector part in the project; the primary function of the managerial part is planning, and the primary function of the effector part is to translate the resultant plan into action (Koskela and Howell, 2002). Project planning defines overall parameters of the project and establishes appropriate project management and quality environment to complete the project. Deliverables for this function include project scope, schedule, budget, risk management, communication and quality assurance.

Managerially, project execution is about dispatching tasks, individuals and groups to work station. When, according to the plan, the time has arrived to begin task execution, it is authorized to start, in speech or in writing. The communication should be bi-directional. The assumptions are that the inputs to the task and the resources to execute it are ready at the time of authorization (Koskela and Howell, 2002). The project management process must be controlled. There must be a unit of performance measurement, standard of measurement and a control unit (thermostat control). Possible variance between the standard and the measured value is used for correcting the process so that the standard can be reached. Project control involves monitoring and controlling risks, managing triple constraints (schedule, budget and scope). There is a process to be controlled, a unit for performance. The assumption is that the process of project control is of continuous flow type, the performance of which is measured at aggregate terms and that the process can easily be corrected by the control available (Koskela and Howell, 2002).

2.8 Conceptual Framework

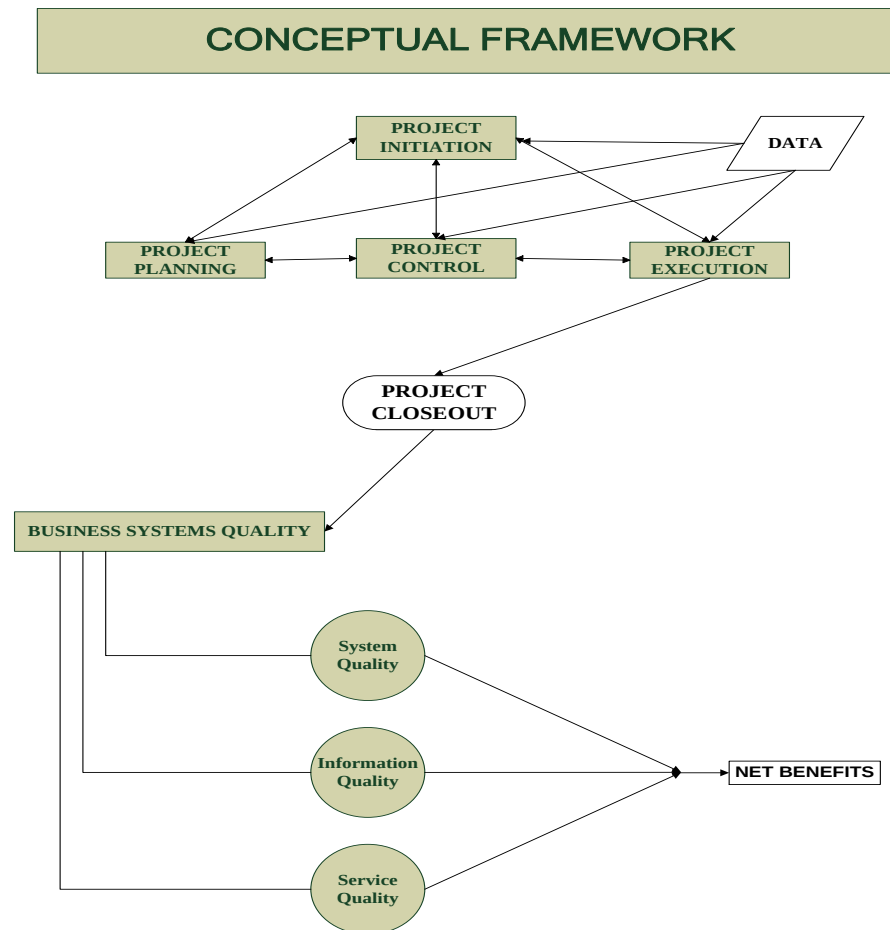


Figure 2.2: Conceptual Project Management and Outcomes Model

The conceptual framework consists of concepts from DeLone and McLean IS Success Model (2003) and Project Management Theory (Koskela and Howell, 2002). The framework illustrates the casual relationship among the effectiveness and efficiency of project management function, quality of outcome information systems and net benefits to the business. Quality is an abstract term with multi-dimensional views and very difficult to measure. To establish level of measurement on quality, there is need to define quality. Quality will be defined in literature review and through stakeholders' feedback on their perception of quality. The conceptual framework also includes the concept and impact of data migration as an iterative project activity in the project lifecycle.

2.9 Literature Gap

The literature discussed above show several gaps in the discussion of IS projects. Firstly, the impact of information system on business organization is mostly focussed on the presumed benefits while ignoring the negative consequences of information systems on business when the IS projects are not properly managed and implemented. Secondly, the impact and effects on project management by economic environment of business entities implementing IS projects is not discussed. Furthermore, after an extensive literature review of information system projects, one concept that is missing or not fully addressed in most of the models is the role of data in information system projects. Data impacts functionality of business system processes and the quality of management information system reports, so data will be included in the conceptual framework. The literature also does not discuss the potential impact and effects of perceived corrupt and dishonest practices during project implementation. Most of the literature under review identifies and discussed budget, scope and schedule as the key constraints of project management. However, one potential significant project constraint which is quality assurance and control is hardly discussed.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the paradigm used, the research approach, criteria used for selecting participants, and the methods and instruments used in data collection and analysis techniques and evaluation strategy which were used in this study. The study was conducted at multiple points in time. Some of the data for the study was collected from respondents more than once.

3.2 Research Methodology

Research methodology is defined as the methods and procedures used to carry out a study. Research methodology has a direct influence on the results of the findings and should be clearly described so that procedures can be easily followed by other researchers or reviewers (Bhattacharjee, 2012).

3.3 Research Design and Type of Study

There are basically two types of research methods: quantitative and qualitative. Quantitative research is concerned with measurement and numbers while qualitative research is concerned with understanding and words (Silverman and Marvasti, 2008). This research used both methods with greater emphasis on the qualitative method where the focus of data analysis was on analysis of substantial quotations from the respondents. Qualitative research provides an insight into some phenomenon of interest within their natural setting. Qualitative methods allow the researcher to study selected issues in depth and detail without being constrained by pre-determined categories of analysis (Silverman and Marvasti, 2008). It focuses on the "why" rather than the "what" of social phenomena and relies on the direct experiences of human beings as meaning-making agents in their everyday lives. Qualitative methods produce a large amount of detailed information about a smaller number of people that results in rich understanding but reduces generalizability (Bhattacharjee, 2012).

The qualitative research strategy and system of inquiry used in this research is case study. Case study approach is particularly useful to employ when there is a need to obtain an in-depth appreciation of an issue, event or phenomenon of interest, in its natural real-life context. (Dul and Hak 2008, p.4; Yin, 2009) defines case study as “a study in which (a) one case (single case study) or a small number of cases (comparative case study) in their real life context are selected and (b) scores obtained from these case are analyzed in a qualitative manner”. Adopting case study strategy allowed the use of multiple sources of data collection and analysis, allowing the researcher to address the research objectives and answer the research questions satisfactorily. Ability to accommodate different research techniques, both qualitative and quantitative, is a salient feature of case study research (Gerring, 2007; Yin, 2009). This research is a single case study with embedded units. A single business entity, a big corporate ICT based company from Malawi with a fair representation of the business systems deployed by most Malawian companies, was selected to represent similar entities in probing the challenges and impacts and effects of IS project management in Malawian companies. The embedded units are six IS projects implemented by case study company in the last 10 years. (Refer to Chapter 4 section 5). Multiple embedded units of IS projects were selected for study to understand the differences and the similarities between the cases of different IS projects (Baxter and Jack, 2008; Stake, 1995), to analyze the data both within each situation and across situations (Yin, 2003), to either augur contrasting results for expected reasons or either augur similar results in the studies (Yin, 2003). Most importantly evidence created from a multiple embedded units with a single case study is measured strong and reliable (Baxter and Jack, 2008; Vannoni, 2015).

Case-selection is of crucial importance in case study research. Case are described and defined by their method of selection – typical, deviant, crucial, and so forth. Any case chosen for in-depth analysis must afford enough data to address the question of interest, as indicated in in the research questions and objectives. If sources are unreliable, scarce, or for one reason or another inaccessible, the case is of little value (Saunders, Lewis, and Thornhill, 2012). Note that the purpose of a case study is to extend our knowledge beyond what it is possible to explore in a large sample (Gerring and Lee, 2016). Of course, this is usually not the only reason for selecting a case. Although case studies are focused on one or several cases they usually aim to represent features of a larger population. The representativeness of the cases is

therefore a fairly universal. Some case studies are chosen primarily because of their presumed representativeness (representative cases). Others are expected to possess the quality of representativeness along with other features that more clearly define the case-selection method (Gerring and Lee, 2016; Saunders, Lewis, and Thornhill, 2012). In this study selection of the case study considered both the access to relevant and enough data to address the research question and the representativeness of the case company. In determining relevance of the case study company the following issues were considered:

- Number of users of information systems in the organization
- Levels of information systems project investment
- Spread of information systems usage in the business's functions and processes
- Significance of information systems to business
- Variety in the type of information systems deployed by the business.

The research approaches in the study are:

- Explanatory is where results are analysed and discussed based on specific objective. The intention is to explain other just than just simply describe, the phenomena studied. Explanatory research is an attempt to connect different ideas and to understand different reasons, causes, and their effects. It is an attempt to find the reason why (Klenke, 2016). Explanatory Research is conducted in order to help us find the problem that was not studied before in-depth. The Explanatory research is not used to give us some conclusive evidence but helps us in understanding the problem more efficiently (Ritchie and Lewis, 2013).
- Empirical deals with collection and analysis of primary data based on direct observation or experiences in the 'field'. The Empirical studies that describe what is happening based on direct observation, focus group discussions, and in-depth interviews. Qualitative empirical studies can provide rich, deep contextual data to help us understand a phenomenon, but cannot be generalized to establish prevalence or incidence of a phenomenon (Ritchie and Lewis, 2013).

3.4 Population and Sampling Design

Table 3.1: Number of respondents categorized by demographics

Business Division	Job Rank/Role					System Use		Gender		Education		Emp. Years	
	Snr. Mgmt	Mid. Mgmt	Pro Staff	Non-Prof Staff	Spec	User	Non-User	M	F	Grad	Non-Grad	<10	>10
Technical													
IS	-	2	1	-	3	-	6	5	1	4	2	3	3
P & I	1	1	3			1	4	3	2	5			5
NOC	1	2	2	-	1	6	-	5	1	5	1	1	5
M & O	1	1	-	1	1	4	-	4		1	3		4
Sub Total	3	6	6	1	5	11	10	17	4	15	6	4	17
Non-Technical													
Finance	3	2	2	-	-	9		8	1	5	4	4	5
Sales	2	3	5	3		13		10	3	7	6	8	5
Marketing	1	-	3		4	-	-	2	2	4	-	2	2
Call center		1		1	-	2	-	1	1	1	1	1	1
Dispatch	-	-	-	2	-	2		1	1		2	1	1
HR/Admin	2	1		1	1	5	-	1	4	4	1	3	2
Innovation	1	1	1		1	4	-	3	1	4	-		4
Sub Total	9	8	11	7	6	35		26	13	25	14	19	20
Total	12	14	17	8	11	46	10	44	17	40	20	23	37
Grant Total	60												

Table Abbreviations: Spec = Specialist; Grad=Graduate; Pro = Professional; Emp. = Employment; Mgmt = Management HR=Human Resources Admin=Administration

3.4.1 Population

Population is the entire group of people, events and things you want to study and have characteristics of interest to the researcher (Yount, 2006). Number of elements in the population is the size of the population (Saunders, Lewis, and Thornhill, 2012). However, by population, many often consider to people only. Population does not necessarily mean a number of people. It can also refer to total quantity of the things or cases which are the subject of our research (Etikan, Musa, and Alkassim, 2016). The subjects of interest in this study are the company's IS projects (12), project teams members, staff and management (552).

3.4.2 Sampling design and sample Size

Sample is a representative portion of the population and sampling as the process of selecting a group of subjects for study in such a way that the individual subjects represent a larger group from which they were selected (Oppong, 2013; Yount, 2006; Zhi, 2014). By sample, we understand a group of subjects that is selected from the general population and is considered a representative of the true population for that specific study (Saunders, Lewis, and Thornhill, 2012). There is the designated sample size, which is the number of sample units selected for contact or data collection. There is also the final sample size, which is the number of completed interviews or units for which data are actually collected. The final sample size may be much smaller than the designated sample size if there is considerable nonresponse, ineligibility, or both. Not all the units in the designated sample may need to be processed if productivity in completing interviews is much higher than anticipated to achieve the final sample size (Lavrakas, 2008). In this study there was 100% response from the designated sample size selected for interviews and all were interviewed accordingly

Six major previous IS projects were under consideration during the study. A sample of 60 employee respondents out of total employee population of 552 participated in the study. The sample employee respondents included ordinary users and employees (34), executive management committee members (4), senior management (3) and middle level managers (5), professional and specialist staff (10) and ex-project managers(4). The study also interviewed individual (6) and corporate (3) customers mostly to solicit their views on service quality and corroborate users views on service

quality. The sample size for employee respondents was limited to 60 due to saturation, it was noted that interviewing more respondents did not provide further or different insight into specified research objectives. The sample size reflected the respondent's demographics of gender; business division; job role; user or non-users, number of years in employment and educational levels. This coding of respondents according to the various demographics helped establish clear data pattern during thematic analysis of the collected data by understanding of 'who said what and why'

The study was carried out in 3 business districts of the company that is Blantyre, Lilongwe and Zomba. The epicentre of the study was the company's head office, service centres and various business premises.

3.4.3 Sampling technique

The main sampling technique used in the study is purposive sampling also called judgemental sampling. Purposive sampling is often employed in qualitative research. Purposive sampling as a non-random sample, the number of people interviewed is less important than the criteria used and that the characteristics of the respondents used as a factor for selection is based on researcher's judgement (Yount, 2006; Zhi, 2014) It is the deliberate choice of a participant due to the qualities the participant possesses. The researcher decides what needs to be known and sets out to find people who are well-informed with a phenomenon of interest and are willing to provide the information by virtue of knowledge or experience and have ability to communicate experiences and opinions in an articulate, expressive, and reflective manner (Saunders et al., 2012). The selection of the sample in this study was based on their experience, expertise and knowledge in technical and business knowledge of a particular project domain, project management and information systems in general. The benefit of using purposive sampling in the research was that it was low in costs, convenient and less time consuming (Saunders et al., 2012).

3.5 Data Collection Methods

While case studies can be built on evidence from one source, it is generally recommended that data be obtained in a variety of ways. Using multiple source of data is or internal validity of the study, where information from different sources corroborates the same sets of facts or events are considered (Mills, Durepos, and

Wiebe, 2010). Data in the study was collected from both primary and secondary source. The data was collected by the researcher and two research assistants for about six months between October, 2015 and April, 2016. The data collection techniques employed were semi-structured interviews and document analysis.

- *Semi-structured interviews*

Semi-structured interviews was the main method used to collect primary data from employee respondents (Refer Appendix A). The semi-structured interview is a qualitative data collection strategy in which the researcher asks informants a series of predetermined but open-ended questions. The researcher has more control over the topics of the interview than in unstructured interviews (Given, 2008). With semi-structured interviews questions can be prepared ahead of time. This allows the interviewer to be prepared and appear competent during the interview. The semi-structured interview guide provides a clear set of instructions for interviewers and can provide reliable, comparable qualitative data (Adams, Lunt, and Cairns, 2008).

Semi-structured interviews method of data collection was chosen in this particular study to provide more room for participants to give own view points, perceptions, recommendations and follow up where answers or questions were not clear. It allowed the collection of in-depth information from the participants on their experiences with systems and IS projects (Saunders et al., 2012). The interviews were audio and video recorded on windows media player for 30 minutes, 60 minutes and 90 minutes respectively for management, technical staff/project team members and ordinary users. Interviewing was carried out at the company's headquarters in the city of Blantyre and the company's service centers in the cities of Zomba, Blantyre and Lilongwe. Semi-structured interviews was preceded by observation, informal and unstructured interviewing in order to allow the researcher to develop a keen understanding of the topic of interest necessary for developing relevant and meaningful semi-structured questions.

- *Document analysis*

The secondary method of data collection in this study was document analysis. Document analysis is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning around an assessment topic (Bowen, 2009). Analyzing documents incorporates coding content into themes similar to how focus group or interview transcripts are analyzed (Bowen, 2009). There are three primary types of documents; public records for example reports and policies, personal documents for example emails and physical evidence for example training materials (O’Leary, 2014). Document analysis is a secondary data source that is more cost and time effective as the data already exists and needs to be analyzed before collecting primary data (Polonsky and Waller, 2010). Secondary data was collected in the study from review of financial, commercial and project implementation and policy documents. The use of document analysis was limited by unwillingness of the company to release most of the financial and sales documents and unavailability of some of the requested project documents.

To ensure internal validity, reliability of data and maintain chain of evidence the study used multiple sources of evidence to collect the research data. For external validity of data, the respondents interview transcripts were archived and are accessible on request

3.6 Data Analysis

The data analysis in this study used content and thematic approaches. The analysis of qualitative research involves aiming to uncover and/or understand the big picture by using the data to describe the phenomenon and what this means. The qualitative researcher, however, has no system for pre-coding, therefore a method of identifying and labelling or coding data needs to be developed that is bespoke for each research (Elo, Kääriäinen, Kanste, Pölkki, Utriainen, and Kyngäs, 2014). Which is called content analysis. Content analysis is a class of research methods at the intersection of the qualitative and quantitative traditions. It is promising for rigorous exploration of many important but difficult-to-study issues of interest to organizational researchers in areas as diverse as business policy and strategy, organizational behavior, human resources, social-issues management, technology and innovation management.

(Duriau, Reger, and Pfarrer, 2007). Content analysis can be used when qualitative data has been collected through: interviews, focus groups, observation and documentary analysis. Content analysis involves coding and classifying data, also referred to as categorizing and indexing and the aim of context analysis is to make sense of the data collected and to highlight the important messages, features or findings (Chambers and Skinner, 2003). On the other hand thematic analysis as an independent qualitative descriptive approach is mainly described as “a method for identifying, analyzing and reporting patterns (themes) within data” (Braun and Clarke, 2006, p. 79). Content and Thematic approaches are often used interchangeably (Sandelowski and Leeman, 2012). By using content analysis, it is possible to analyze data qualitatively and at the same time quantify the data where there is a need for descriptive statistics for example counts and percentages (Guest, Macqueen, and Namey, 2011; Gbrich, 2007). Content analysis uses a descriptive approach in both coding of the data and its interpretation of quantitative counts of the codes (Downe-Wamboldt, 1992; Morgan, 1993). In content analysis you can categorize individual words or phrases from the qualitative data into their appropriate themes. These themes can then be analyzed statistically. Conversely, thematic analysis provides a purely qualitative, detailed, and nuanced account of data (Braun and Clarke, 2006).

Firstly, small-scale complete pretest interviews and data analysis involving 5 participants drawn from the company’s business sections was carried for 2 weeks in the month of October, 2015. The purpose of which was to find problems and barriers related to participants' recruitment and participation, to get engaged in research as a qualitative researcher and test methodology of research.

For 4 months between May, 2016 and August, 2016 the recorded interview transcripts from the respondents were transcribed into written form (MS Word Document) by hand using Windows media player, played iteratively at slow speed. For closer study, the transcription was very detailed in order to capture features of talk such as emphasis, speed, tone of voice, timing and pauses which were very crucial in the interpretation of the results (Creswell, 2013).

Data analysis was carried out for 3 months between September, 2016 and November, 2016 using thematic approach and based the on substantial quotations from the respondents. The thematic approach was done at two levels. The first level was basic or manifest level which looked at who said what but no comments or theories on how and why. The second level was higher or latent level where concern was more on subject's responses as well what may have been inferred or implied. Using software package QDA Miner Lite and augmented by hand, large volumes of unstructured data collected from the semi-structured interviews was classified, summarized and tabulated based on coding and themes in the conceptual framework (Refer Chapter 2 section 8 Figure 2.2). Content analysis was then used on the tabulated data that was collected from the study to examine relationships in the data, build patterns, identify trends and build a body of evidence to support the case study. Content analysis was also used to categorize individual words or phrases from the qualitative data into their appropriate themes and then analyzed for descriptive statistics, mostly counts and percentages (Braun and Clarke, 2006).

3.7 Ethical Considerations

During the conduct of the study in order not to destroy the physical, social or technology environment of the population but rather to add value to the society (Cico, Vogeley, and Doyle, 2011). The study followed ethical considerations as follows:

- Obtained a written permission to conduct the study from the University of Malawi as it has been given the mandate by the Ministry of Educations Science and Technology (Refer Appendix B)
- Obtained a formal written permission to conduct the study from the case study company with assurance that sensitive findings from the study and information provided or obtained from the business or other participating institutions or persons will be dealt with in a manner not to destroy the individuals, the business or society (Appendix not included in the spirit of anonymity)
- Informed consent was sought from the study participants in either written or verbal form to conduct interviews, take pictures, digital audio record interview as well as access to documents (Refer Appendix C). Anonymity and confidentiality of the study participants was maintained by referring to the study participants as respondents 1 2 3 X

3.8 Limitations of Study

The study encountered the following limitations:

- i. Limitations to information access on the company's financial and sales records and project reports which the business considers confidential. This impacted the researcher's ability to evaluate exact added value of IS projects on the company's financial and market position. In mitigation the researcher tried as much possible to get some of the data in the documents directly from respondents narrations
- ii. Unwillingness of sample subjects to share what they consider to be sensitive information due to job security concerns and employee information disclosure agreements

3.9 Summary of Research Design

This chapter has presented the methods used to conduct the research including the qualitative research design, sample size of 60 respondents and data collection methods of semi-structured interviews and documents analysis. The chapter has also presented how the results were analyzed using content and thematic analysis approaches. The next chapter is focusing on the case description for case study IS projects.

CHAPTER 4

CASE DESCRIPTION FOR CASE STUDY IS PROJECTS

4.1 Introduction

This Chapter describes the context of the study where the evaluation of the relationship among information systems projects, quality of systems and net benefits to business from information systems was carried out. The aim of the Chapter is to bring a better understanding of the case study specifically in relation to the research questions and objectives. The Chapter is divided into three sections: Corporate Profile of Case Study Company; Case Study Project Management Policy and Practice and finally 6 sample major IS projects implemented by the case study company in the last 15 years

4.2 Brief Corporate Profile of Case Study Company

The case study is an ICT based company with large subscriber base across the southern African nation of Malawi. The company is mainly located in the southern part of Malawi. The company employs approximately 552 employees through its six major departments of Commercial, Technical, Finance, Administration, Corporate Divisions. The company offers voice and data products and services to residential and business customers.

Project Management Policy and Practice of Case Study

4.4.1 Project Initiation

The company's project management policy document recommends that IS department in collaboration with user departments should initiate IS projects after identifying a need or a problem. However, in practice there is no single way of initiating IS projects. Each project is initiated differently depending on the department with the business need, or system type or requirements and recommendations by regulators

and system vendors. For example, customer facing system are often initiated by commercial division while network operation systems are initiated by executive management. The policy advocates that all key stakeholders should be communicated to, be fairly represented and actively participate in all important project activities for example requirements gathering, specification and data collection.

The Business Case and Control Form (Refer Appendix D1) are two key documents used by the executive management and board to approve projects. The submission of these two documents for approval officially signifies the initiation of the project. The key role of executive management during project implementation is to facilitate funding, provide skilled labor and other resources. The executive management is also responsible for authorization of vendor payments, resolving contractual disputes with vendors and high level scrutinizing of project deliverables. Most importantly executive management provide moral support to the project team. The executive management also chooses a project sponsor among themselves who is the contact person between the executive management and the project implementation unit on all issues relating to the project.

Selection of project managers for huge and complex multi-billion kwacha high risk projects is the responsibility of executive management through the office of the Chief Technical Officer (CTO). However, sometimes the project managers are selected by consensus of project stakeholders during the project initiation ‘kick-off’ meetings. Among some of the key attributes for an ideal project manager listed in the policy document are in-depth knowledge of project management, technical and business knowledge of the project domain and leadership abilities. The department that triggered the need to initiate a project is mandated to nominate names to be considered as members of the project team. The executive management with assistance of the head of the triggering departments has the discretion to approve or disapprove the proposed names. Each project has sponsor who is responsible for securing funding, resolving major conflicts and ensuring that the project is within budget, scope and schedule. For complex projects there could be multiple project teams of 4 to 6 members each dealing in a specialized area of the project.

Most of the company's systems are outsourced. Planning and Implementation (P & I) division is mandated to identify vendors who quality to participate in system bids. The winning vendor is expected to deliver systems that are cost-effective, of good quality, durable, are scalable to future technologies and adaptable to changing business and user requirements. The company mostly acquires systems from Indian and Chinese vendors. The key factor in the choice of these vendors and systems is the low quoted system acquisition prices, other than the weighted average of all key recommended factors for example vendor reputation, market standing, support services and system flexibility.

4.4.2 Project Planning

There are two types of appraisals carried out during project planning, that is technical and financial appraisals. The technical appraisal may include capacity of the existing network to accommodate new systems, integration with existing systems and technologies, scalability with future technologies and systems and the technical risks. The technical appraisal answers all the critical technical questions for example for Long-Term Evolution (LTE) project the question was whether to use Time Division Duplex (TDD) or Frequency Division Duplex (FDD) technologies. Often feasibility studies and research for new technologies and systems are done in advance in anticipation of the company's future direction and market demands. It is the responsibility of the P & I and finance divisions assisted by commercial and IS divisions to do project appraisals. However, in the past due to limitations in internal staff skills, the technical appraisals of major IS projects like the Telecom Development Network (TDN), Online Charging System (OCS) and New Generation Network (NGN) billing systems was done with support of the external consultants. For larger and more complex projects for example the TDN and NGN Soft Switch projects there is an executive management subcommittee responsible for technical appraisals. There is little or no strategic and operational appraisals done for example equipment integration, subscriber growth, social, technological and economical demands.

Financial appraisals for IS projects initiated by commercial division which are meant for revenue generation are done by the P & I division. In contrast IS projects that originate from the technical departments are often expensive and cost billions of

Malawi Kwachas therefore the financial appraisal are done by a project accountant from the finance division under the direction of the P & I department.

The table 4.1 below summarizes the quantitative methods and tools used for project financial appraisal in the company.

Table 4.1 Financial Appraisal Methods

Financial Appraisal Method	Purpose
Net Present Value (NPV)	• Main Method to determine additional financial benefits accruing from project investment like increased revenue, reduced operational costs and increased profitability
Payback Period	• Complimentary to NPV to determine how quickly the project initial investment will be recouped
Return on Investment	• Complimentary to NPV to determine if the project costs justifies the revenue streams

The total estimated capital investment for 6 major IS projects implemented in the last 10 years by the company is 6.5 Billion Malawi Kwacha. Expensive projects costing billions of Malawi Kwacha are often funded from bank loans. Projects averaging below a billion Kwacha are mostly funded from internally generated revenue supported by a local bank loan. If there are funding limitations projects implementation is done in phases as when funding become available. The project sponsor is responsible for project budget and control while the project accountant is held accountable. The approval of project expenditures is the responsibility of the head of P & I, however if the costs are too high then the CTO is responsible. The main project cost drivers are: agreed contract amounts, Service Level Agreements (SLAs) costs, allowances, and software licensing and hardware costs. Among some of the key challenges in project budgets and funding are the lack of working capital, volatile economic environment, unstable local currency, and bureaucratic procurement processes.

Project scoping is mostly done by the stakeholder user and technical departments. The key activities during scoping are requirements gathering, identifying business

tasks and processes that will be incorporated as functional modules in the systems and defining the complexity and boundaries of the project. The availability of funding, decisions, recommendations and changes by executive management and stakeholder departments have a final say on the approved project scope. Scheduling of projects tasks and milestones is mostly done using MS Office Project software. The project management policy document recommends the use of PMBOK as a standard project management methodology. However, in practice due to the lack of internal skills and knowledge in project management PMBOK is not fully adopted, instead the company uses custom designed project methodologies templates adopted from both PMBOK and PRINCE II

The business case document includes a risk planning section. The common project risks include: damage of equipment in transit, budget risks, cash flow shortages, vendor and contractor disputes, shortage of skilled staff and changes in project scope and schedule. No project can be approved if risks are not measured, documented, agreed by the project team and mitigation put in place on how to deal with the risks when they materialize. Big risks like currency fluctuations are handled by executive management while minor risks like the resignation of project team members are handled the project managers. Currently there is no project management risk assessment policy but one is being developed to guide the business on the accountabilities and reporting structure. The risk department plays an advisory role during IS projects. The department registers all existing, emerging and changing risks for easy follow up with auditable areas and issues a quarterly management reports which are then discussed in the audit and finance committee of the board.

4.4.3 Project Control

There is no quality assurance and control plans and visibility during IS project implementation. Quality control and assurance is done arbitrary by comparing the deliverables and milestones in the business case and control form documents against actual project results. In addition, a checklist of vendor agreed specifications is verified against what has actually been implemented. Identified exceptions must be resolved by the vendor during specified time frame failing which the vendor contract certificate may be withdrawn. If the exceptions are critical the project outcomes may be rejected outright. The verification exercise is based on vendor prepared check list

on the notion that the vendor best know their products and services therefore are best placed to prepare the check list. To ensure financial control and accountability during project implementation financial reports submitted by project accountant are reconciled against financial reports submitted by the head of P & I department. For transparency the release of project payments requires approval by both Chief Finance Officer (CFO) and Chief Technical Officer (CTO). The payment is only done after both the CTO and CFO are satisfied with the certification of project completion levels

4.4.4 Project Execution

Communication during project implementation is mainly via daily emails, weekly meetings and monthly report and more recently social media. The project managers are supposed to hold daily briefings with project team members, hold meetings twice a week with project sponsors, vendor's team and managers from user departments and submit monthly project reports to executive managements. Some of the key issues discussed or included in the periodic meetings and reports are schedule, budget, supplier payments, project milestones, financial and other resource constraints and technical challenges. There are no corresponding project reports from the vendor team to cross reference and counter-balance the project managers' reports. The project conflict resolution plan is to handle most of the project disputes and conflicts at project level by the project manager and only escalate serious issues to executive management. Executive management reserves the right to change project personnel if persistent project conflicts threatens to derail progress.

The company's methods of new system acquisition is dependent on complexity and size of project and the availability of custom made systems on the market. The complex standard systems for example the NGN Billing and NGN Soft Switch that provide core telecommunication services are often acquired from off-shore Chinese and Indian vendors. The vendors are provided with the company's business specifications and requested to customize existing systems on company's site to suit the company's business requirements

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Data migration is a critical task in the implementation of the company's major IS projects. Special teams comprising of staff from the commercial, finance and technical divisions are set up and approved by the executive management to champion

the data migration exercise. Some of the challenges associated with data migration are: incorrect manual data records; limited time and funding allocations; the dynamic nature of the business data; use of manual process to analyze, format and load data and the lack of qualified and experienced internal data analysts.

There are two types of testing techniques adopted during project execution which are: (i) Project Acceptance Testing (PAT) done by technical teams to certify quality of work done before the vendor is issued with a provisional certificate and (ii) User Acceptance Testing (UAT) done by the user department to test the use and functionalities of the system modules before the systems are commissioned in production environment. The preparation of test case documents for both PAT and UAT is shared responsibility between the company and vendors however the vendors have a greater contribution and draft the final document

Training of users and information services support staff on new information systems is either organized and paid for by the company or vendors or jointly. Depending on availability of resources and agreed arrangement with the vendors, training is either conducted locally on company site or the company staff travel to vendor countries for training. The training mostly covers user operations, basic system administration and maintenance of the systems. To retain their influence and business interest during the training most of the vendors do not fully transfer the required knowledge, skills and competence to internal staff to use and support the systems.

There is no formal change management plan during IS project implementation to deal with consequences of changes for example change in project scope, organization structures, business processes, micro-economic environment and executive management. Furthermore, the employees are not briefed on what will be the expected impact of the new systems on customers and the business. Users are mostly not consulted on the merits of changing from old to new systems.

4.4.5 Project Roll out and Close Out

Dependent on size and complexity of the project, availability of resources and existing network infrastructure, the changeover method from old to new system can be direct or parallel. Direct change over approach is mostly considered when risks are

limited and resources are available, if not then alternative pilot changeover is used. In rare situations where resources are readily available and the existing business environment can easily be replicated a parallel changeover is considered.

The project management policy document recommends that post project implementation there should be the detailed review of the just completed projects. The purpose of the review is twofold. First, to ascertain if set targets in the technical and financial appraisal that justified the project have been met or not. Secondly, to draw lessons and future best practice. However, in practice post project implementation on the minimum there is only stakeholder's meeting. The meeting is to review and report on the project success, challenges and results and produce handover reports, reference manuals, test results reports and network diagrams from the vendors and project teams.

Post project implementation the company is expected to enter into Service Level Agreements (SLAs) with vendors to support service availability and maintenance of the systems. The levels of vendor support is dependent on SLA category. For Gold category there is full support with zero tolerance for downtime, readily available spares and vendor support staff on site. Traditionally, post project implementation business systems for example SAP ERP and NGN Billing are handed over to IS department for support and administration while customer network operational systems for example NGN Soft Switch are handed over to service operation department.

4.5 Major IS Projects Implemented by Case Study

In the last 10 years the company implemented many major IS projects with the overall objectives of expanding customer network, improving customer service delivery and increasing revenue and profitability. Among some of these IS projects are: Online Charging System (OCS); Next Generation Network (NGN) billing system; NGN Soft Switch; SAP Enterprise Resource Planning (ERP) Business One and Telecommunication Development Network (TDN). Hongxiu, Mäntymäki, Matti, Zhang, and Xianfeng (2014) argue that globally, telecommunication service providers depend on information systems (IS) based technologies to create customer products and services. In line with Hongxiu, et al (2014) observations the case study company

has invested in information technologies to gain competitive advantage, increase market share, and generally add value to the business and in some cases to survive in an ever changing business environment. In the subsequent sections below, 6 of the major IS projects implemented by MTL will be discussed.

4.5.1 @ Billity NGN Post Paid Billing System Project

In 2007 the case study company introduced the first comprehensive post-paid billing system called Telco Billing. The system automated some of the key billing processes and tasks however it was limited in scope and functionality. Some important business tasks were still being executed manually. Moreover, the generation of billing invoices was tedious, long and sometimes inaccurate. Critically, Telco Billing was not integrated with the core customer network switches for automatic subscriber service provisioning. To address these shortcoming and others as reported by the users, the IS division initiated the @billity NGN post-paid billing system in 2014. The project budget was at about 0.69 Billion Malawi kwacha, funded from internal revenues and a bank loan. The @billity system was an existing generic system for mobile operators developed by Tecnotree Ltd of India. To suit the business requirements of the case study company as a data and fixed line operator the system was to be significantly customized. Customizing the @billity system was a major challenge and learning experience to both vendor and client.

The NGN Billing system project was keenly anticipated by management, the users and technical staff. The system was billed as game changer that was to increase revenue through enhanced post-paid billing services. The interest, anticipated benefits and objectives of the NGN billing project cut across all business divisions and employee grade levels as summarised in Table 4.2 below.

Table 4.2 Business objectives of NGN Billing System

Division/Section	System Objective/Goals
User - Commercial and Finance	• Improved customer service delivery • 99.99% service availability and reliability • Easy to use and navigate • Automatic service provisioning • Integrated with other systems e.g. SAP ERP • Easy to configure innovative services and products • Accelerate revenue collection • Reduce revenue leakages
Technical-IS and Service Operation	• Easy to maintain and support • Less technical challenges and errors • Scalable with future technologies • Integrated with customer network switches
Executive Management	• Drive business strategy • Expand customer network • Increased employee productivity • Increased revenue and profitability • Improved working capital

Some of the key benefits specified in the business case document for the NGN billing were: automatic provisioning of customer service accounts to the subscriber network switches, improved automation of bill invoicing and seamless integration with SAP Enterprise Resource Planning (ERP) system. The NGN billing system was expected to generate accurate and analysable current and historical reports thereby improving reporting and decision making processes.

4.5.2 OCS Prepaid Billing System Project

Online Charging System (OCS) project was initiated and implemented by commercial division in 2015. The main objective was to enhance customer experience with innovative pre-paid services and products with view to increase revenue. The project cost 1.5 billion Malawi kwacha funded from company's internal revenue. After launch of the OCS it was envisaged that the company will be able to offer services

and products it could only dream of before. For example, the marketing team would be able to launch customer promotions through loyalty and rewards, offer tailor made services like bundles, electronic vouchers, family and friends and bundles with special features like calling day services. Another major reason why the OCS project was launched was to increase employee productivity, for example by allowing decentralization of voucher recharging and subscriber management tasks from a single network engineer working in the backend to multiple sales staff working on the front end.

To ensure sustainable executive management support and interest, in the structural setup of the OCS project, the project team was reporting to a steering committee which in turn was directly reporting to executive management. The OCS project was implemented during lean financial period for company hence the company was obliged to reduce project budget.

4.5.3 SAP ERP Project

The first automated financial system for the case study was Sage Line 100 which was implemented in 2004. However, the systems was limited in scope as it did not automate all the business and finance processes. There was still a lot manual intervention involved to complete the execution of most business tasks. To overcome these limitations with funding from internal revenue, the finance department initiated the 0.2 Billion Malawi Kwacha SAP ERP project in August, 20008. The project was subsequently implemented by December, 2008.

The main objective of SAP ERP project was to provide a comprehensive accounting and business management solution that seamlessly integrated sales, marketing, Customer Relationship Management (CRM), finance, commercial and inventory management. SAP was the one solution to meet and improve business processes with one-off implementation costs, flexible licensing options and good vendor support. The expectation from the users and management was that SAP ERP was to fulfil most of the specified user and business requirements. Moreover, the system was to be a great improvement in terms of reporting, execution of business processes and capabilities for multi-user access. Unlike the old SAGE financial system with the SAP ERP

system sales or billing transactions would be captured directly and automatically from the point of transaction into the accounting ledgers without any manual intervention. To ensure success of the SAP ERP project the focus was to involve and communicate to all key stakeholders, document all specified requirements, facilitate enough funding, contract qualified system vendor and recruit qualified and experienced project manager and team.

4.5.4 NGN SOFT Switch Project

Next Generation Network (NGN) Project was initiated in 2011 by executive management and implemented in 2013. The NGN switch technology was to provide both fixed line and broadband from same telephone exchange. The objective was to expand customer network with view to increase revenue. The company invested about 1.1 Billion Malawi Kwacha with funding from local bank loan and internally generated revenues. The Huawei NGN switch technology was to replace legacy digital systems that were using Alcatel, Siemens, and Neax metered switches Time-Division Multiplexing (TDM) technology

The technology benefits of NGN switch system had the following benefits over existing switch technologies:

- Broadband Internet up to last mile through xDS
- Voice and data sharing same infrastructure resource
- More VAS services than legacy Digital Switches
- Centralised and remote operations, maintenance and management
- Internet and IP based therefore interoperability with other switches

To ensure success of the project the emphasis was on: Identifying and actively involving all stakeholders in the project's key activities; identifying a qualified and experienced project manager capable of motivating project team to perform well and selecting a well-balanced project team with technical and business knowledge. The technology was to be scalable with future technologies and business requirements. For example the technology included Voice over Internet (VOIP) option to migrate international calls in the foreseeable future from expensive and unsustainable earth stations to NGN Soft Switch by 2015. The project's technical appraisal covered both

fixed line and mobile services to be implemented in two respective phases. The projected plan was that by 2015 all legacy switches should be completely phased out and replaced by the NGN switches technology and that by 2017 the NGN technology should cover 90% of the urban customers 70% of rural customers.

4.5.5 TDN Project

Telecommunications Development Network (TDN) project was a Fiber Optic Cable infrastructure network project initiated by board and executive management. The main goal of TDN project was to diversify the company business from voice services to data services. Upon successful completion of the TDN project the company was to house the largest fiber network backbone in Malawi. The total project costs was 4.4 billion Malawi kwacha financed by foreign denominated bank loan from the Trade and Development bank of Southern Africa. The stated strategic business objective of the TDN project was changing the company's strategy and direction from many years of telephony as a core service to data and internet. This change in strategy was to necessitate a change in human capital and structures. The emphasis now was on leaner structures and staff with potential to multi-task in copper and fiber network. Most of the copper technicians and related staff were to be retrenched. The retained staff was to be retrained in fiber network. The business divisions and usage of resources was to be aligned and driven by the new business dynamics.

4.5.6 Internet on CDMA Project

The project was initiated in 2013 by executive management to provide internet services on CDMA services and handsets. The total project cost was 0.3 Billion Malawi Kwacha funded from internally generated revenue. There was technical feasibility challenges with the project. For example the feasibility studies did not consider the scalability of CDMA technologies with internet services. Expensive equipment was purchased from vendor to provide the required services but it was rendered obsolete upon testing. The project was subsequently cancelled. The number of CDMA service subscribers declined from 70, 0000 to 25,000 between 2014 and 2016 mostly due to poor quality of services from an almost obsolete CDMA network. This dramatic loss of subscribers triggered the business to reach a decision to discontinue with all CDMA services by 2017.

CHAPTER 5

RESEARCH RESULTS AND DISCUSSION

5.1 Introduction

This chapter is about the empirical findings of the study based on the data collected from interview transcripts and existing documents. It also includes a discussion of major findings derived from the data based on the conceptual framework presented under the literature review. The finding focusses on: how information systems projects are initiated, planned, controlled and executed and closed in the case study company; how the conduct of project implementation affects the quality of the systems that come out of the IS projects; how the quality of the systems that come out of the IS projects impacts and affects the business strategy, objectives direction and benefits of the case study company.

5.2 Project Management

In this discussion project management refers to the management of IS projects tasks and stages of initiation, planning, control, execution and closure.

5.2.1 Project Initiation and Planning

Firstly, the findings of this study suggest that there is no clarity on who actually initiates IS projects in the organization. Different IS projects have been initiated by various stakeholder. This is notwithstanding that company's project management policy documents clearly recommends that the IS department in collaboration with user departments should initiate IS Projects after identifying a need or a problem. The findings further suggest that the company employees depending on their role, position and business section hold different viewpoints on who is responsible for initiating IS projects. This is contrary to research findings by Hoffer et al (2011) who argued that

IS projects should be initiated by a stakeholders group and driven by technical and financial viability of the project.

Secondly, the findings show that most of the users, technical and support staff are often side-lined or under-represented in most of the project activities. Descriptive statistics from content analysis of interview results shows that about 65% of the users have never participated in any project activity except in some sort of brief training. The figures are even higher for staff who joined the company in the last 8 years. About 90% of those who participated in some project activities said they were not fully and actively involved other than just being token figureheads with no real influence or impact. Participation in project lifecycle activities is mostly dominated by middle management staff and a few same favoured employees from the commercial and technical departments.

Furthermore, the users who are the systems owners are mostly not involved at the onset of the project. The users only get partially involved in latter project stages of testing and training. However, at these project stages it is too late for the users to understand the project objectives and make any meaningful contributions. Consequently, the users do not take full ownership of the projects and its outcome systems. Additionally, the findings suggest that there is poor and exploitative relationship between the project implementation unit and stakeholder business departments characterized by infighting and lack of collaborative effort. Most critically only a few users with business knowledge of the project domain are involved during the critical project stages of requirements gathering and scoping hence are overwhelmed and unable to do a proper job. These results are similar to findings reported by Chaos, (2005; Project (2005); 2014); Oracle White Paper (2011); Shuhab-U-Tariq (2010) and Vliet (2007) who all argue that the lack of stakeholder involvement and cohesion is one of major causes of IS project failures. The study further found that the company's IS projects goals are often not communicated to all stakeholders, not properly defined and not consistent with strategic goals and direction of the business contrary to findings from Shuhab-U-Tariq (2010) who concluded that even though IS projects goals are not always met but were mostly consistent with the goals of the organization that was implementing the project.

Thirdly, the findings indicates that the vendor evaluation exercise is not transparent and rigorous and the vendor technologies are under-researched. Consequently, the choice of the wining vendor often ignores the recommendation made by the vendor evaluation team and is mostly based on the lowest bid price while ignoring other important recommended key factors. (Refer to Chapter 4 section 4.1.2). This is consistent with findings of Loonam and McDonagh (2007) which state that management should not let the vendor dictate the technical solution but take an active part in those decisions as well and that management should be wary of low bid prices that do not factor in total cost of ownership.

Fourthly, the findings suggest that project managers selected to lead the project teams often do not meet the attributes required for an ideal project manager as specified in the company's project management policy document (refer to Chapter 4 section 4.1.1). This was evidenced by the frequent change of project managers and voluntary withdraws by others while the projects are on-going. The project managers mostly lacked leadership, people management and technical skills and business knowledge of the project domain. The project managers failed to select fair, balanced and knowledgeable team members. The inadequacies of the project managers was further evidenced by the many challenges associated with the projects implementation effort and vendors not fulfilling some of the critical contractual agreement and system specifications under the project managers watch. There is a narrow pool of appropriately qualified internal staff who can effectively participate as project team members and managers. Most of the staff lack required skills levels in project management and project domain technologies and the experience of working with similar projects. The findings reinforce similar findings by Marco and Lister (2013); Isfahani (2011); Warden, 2003) and Leijten1 et al (2010) which concluded that the lack of both soft and hard skills by project managers and the lack of skilled internal staff are some of the reasons why most IS projects either fail or are challenged.

The study findings show that the bureaucratic nature of the company and the absence of visible effective communication channels to employees during IS project implementation is a major challenge that leads to breakdown in project communication. There is no formal and timely communication of project goals, deliverables, developments and status to all users. This is consistent with findings

from Project World (2005) and Glaser (2004) which both noted that effective communication and meetings fail to take place because IS projects are usually complex and involve a lot of analysis, people and work such that the team is too busy to communicate. Executive management sees no visible progress so projects managers sees no reason to communicate projects progress. Glaser (2004) further noted that projects run over a long period of time and with the breakdown in communication it is impossible for all parties to clearly understand the project requirements leading to an abstract project evolution.

The findings of this study suggest that the company implements complex, ambitious and huge IS projects without detailed implementation plans and required financial, human and technological resources. The projects are therefore often under-scoped and under-funded. There is shorter timelines and unrealistic schedules that are set to rush through projects and save costs. Additionally, there is a considerable time gap between the project plan and execution meanwhile the business environment is constantly changing which in turn requires changes in project scope and plans. More often than not the company fail to implement projects based on results of concluded technical and financial appraisals, mostly due to unrealistic estimates and prohibitive vendor prices for systems that meet the specifications in the technical appraisals. This is consistent with findings by Fichter (2003) who cites large sized, overambitious project scope, budget and schedule and absence of detailed plan that place unrealistic expectations on the project as one of the major causes of IS project failure. However, the finding of this study are different from those of McConnel (2011) and Fichter, (2003) is that the study also found out that the company launches parallel projects that demand unsustainable resources. The focus of resources on multiple IS projects impedes the business operations that are supposed to generate revenue to finance the IS projects hence a vicious cycle is created.

The study further reveals that project planning is haphazard and risky because recommended standard project methodologies like PRINCE II and PMBOK are not fully adopted. Furthermore, there is minimal or no automation of project activities using project software and no formal change management plan. Risk planning and management in IS projects was only instituted in the company in July, 2014 so thus

far only two recently implemented projects, the OCS and NGN Billing system underwent some kind of risk assessment before and during project execution.

5.2.2 Project Execution and Control

The study findings show that 4 (OCS, NGN Billing system, NGN Switch and TDN) out of the 6 major IS projects under study faced the project triple constraints of scope, budget and schedule during execution. Some of projects for example NGN Billing Systems and OCS were implemented during lean financial periods when the company was not able to generate enough working capital from internal revenue hence was unable to sustainably fund the projects. Changing user and business requirements while projects execution is underway and the need for major customization of vendor systems (as was the case with NGN billing and OCS) to suit the company's business process and requirements creates schedule and budget overruns. Consequently, there are significant variances between actual and budgeted project costs. These findings are consistent with findings of Taimour (2005) which concludes that the triple constraints of budget, scope and schedule are inevitable in any complex project and emphasizes the significance of making correct estimations in time, cost, effort and resources to have successful IS projects.

The findings indicates that during project execution the system, user and project acceptance testing plans are vendor driven and designed. The actual testing is incomplete, partial, inadequate and sometimes dishonest. There is too much dependency and trust on vendors which allows them to manipulate and falsify test results with no consequences. During testing the project team at the behest of management and vendors prioritize time and cost considerations over delivering quality and fully functional systems. Consequently, most of the failed test cases are not resolved before project closure. According to study interview results 30% of the users have never participated in User Acceptance testing (UAT) and that the 70% of those who did only partially participated. Both percentages increases for participants who just joined the company in the last 5 -8 years. Findings by Zouaghi, and Laghouag (2016) also cites system testing as a critical position in the implementation of IS projects and say that the functionalities need to be tested both alone and together with other (existing) technology. Zouaghi, and Laghouag (2016) furthers noted that

the testing should also confirm that the system is working according to business requirements.

The study shows that 90% of the users and 80% of the technical staff are dissatisfied with user and system administrator training provided by vendors. The training is limited in scope, time and does not involve all critical support staff. There is an obsession by the company to cut down on training costs and number of participants. The training is overloaded with too much information and sometimes irrelevant information. There are language barriers between trainers and trainees as most of the trainers do not come from traditional English speaking countries. The training sessions are not practical with minimal hands-on experience. Low levels of information technology knowledge and exposure among the staff also makes delivery of systems training difficult without first giving basic training in computers. Inadequate training means limited knowledge and skills within the organization to ably use and support the systems. The problem of transferring systems knowledge to the company's staff is compounded by the tendency by the staff to exaggerate their abilities which makes it difficult to know actual training requirements of the staff. 95% of the user and IS support staff said they are less confident and capable to use and support the systems respectively after only a few days of training and that it takes months and personal initiatives post project implementation to gain required levels of confidence. The deliberate reluctance of the vendors to transfer knowledge to the company's staff creates vendor dependency for support services which forces the company to enter into very expensive service level agreements with the vendors. The study findings are similar with findings by Loonam and MacDonagh (2007) which states that inadequate training is one of the frequent reasons why many IS projects fail or are challenged but different in that Looman and MacDonagh, (2007) studies did not address the issue of knowledge transfer from vendors to client staff. However, Zouaghi and Laghouag (2016) stated that another important element in project management is to manage the relationship to vendors and consultants (if such are used) and therein the most critical is to establish a functioning knowledge transfer mechanism during the project as well as after project closure.

Literature and practice in IS projects mostly emphasizes on the common project triangle of schedule, budget and scope. Often conspicuously missed out is quality.

According to Lyytinen (1988) cited in Soja (2006) implementation of successful IS projects involves reaching goals and implementation scope within planned time and budget but still achieving user satisfaction. This study differs from previous studies in that it identifies quality as the fourth critical factor in project management. The study results suggest that there is no serious plans, effort or mechanisms to enforce and control quality by the project team and management during project execution. There is no rigorous oversight plan on the vendors executing the projects and technical implementation is mostly done by the vendors. As a result of this lack of quality control and assurance the project milestones and deliverables are compromised on quality. The findings also show that other factors that contribute to poor quality of project work are: payment dispute with vendors, failure by the company to hold the vendors accountable when the vendors do not adhere to what was legally binding and signed in the Project Contract Agreement document and undue influences on timelines by executive management.

The findings of this study show that as agents and catalysts of change, the users of the systems are ill prepared and trained to deal with the IS projects and the systems. There is no serious management engagement with the employees to inform them of how the IS projects and its outcome systems will impact their job roles, responsibilities and security. The employees are not briefed on what will be the expected impact of the new systems on customers and the business as a whole. The users are either not informed in time or not informed at all why systems are being changed nor are their views solicited to warrant a system change. Poor user change management and biased and poor handling of conflicts among project stakeholders negatively impacted the smooth execution of the projects. The study further reveals that the organizations' rigid structures, hazardous work environment, and culture impacts project execution and results. Among some of the prevalent and self-evident negative organization culture practices are resistance to change, working in silos, not sharing information and placing too much emphasis on position and hierarchy while sidelining and looking down upon subordinate. The consequences of negative cultural practices are evidenced by the lack of collaborative effort between the project team and other project stakeholders, the low level commitment by staff to IS projects and little enthusiasm with the new systems. The findings are similar to those of Demarcus and Lister (2013); Young, Young, Jordan, and O'Connor (2012) who argued that IS

project are social undertakings that need to be attuned to the cultural, organizational and social environment. According to these researchers the lack of people management skills and organization culture adversely affect the company's projects at all stages compromising quality of the outcome systems. The study agrees with the findings of Williams and Williams (2007) that businesses are more likely to benefit from IS projects when project implementation is supported with good change management and organization cultures and structures.

The findings indicates that the company's preferred and convenient method of acquiring new systems is purchasing generic existing vendor systems or systems designed for other vendor clients. However, these generic systems require significant customization to suit the company's business requirements and processes. Suiting complex systems to business requirements is time, effort and resource intensive. The company attempts to suit the business processes to vendor systems but end up with many technical challenges and errors. This is in contrast with findings by Bielh (2007) who argue that fitting vendor systems to client business processes is better option than customizing complex business processes.

The study show that some (approximately 25%) of the critical business data for example customer subscriber information that was migrated into the NGN post-paid billing system was incorrect and had mismatching and inconsistent records. This was attributed by the users and technical staff to over-dependency on vendors to manage data migration. The vendors are not best placed to manage data migration because they lack detailed understanding and knowledge of the business data and processes.

5.2.3 Project Closure and Audit

The project management policy document recommends the review and drawing of lessons from recently completed projects. However, study findings indicate that there is no serious attempt to do post project implementation reviews or draw lessons from past IS project. This is evidenced by the company's continuous repetition of the same project pitfalls when implementing subsequent IS projects. The study further show that post project implementation there is no financial or technical audit to ascertain if the project's appraisal targets that were set during project initiation and planning stages and that justified the business case for implementing the projects are achieved

or not. These findings are in contrast to recommendations from theory and practice in standard project methodologies for example PMBOK or PRINCE II and recommendations from various researchers for example Shuhab-u-Tariq (2010); Jern (2009) who argue that there is need to have proper project closure, do review, audit closed projects to ascertain value added and to draw lessons from just completed projects and apply the lessons in future projects.

3 out of the 6 major IS projects under study (NGN billing system, OCS and NGN Soft Switch) were officially considered open ended because there was no sign-off with vendors at the time the systems were commissioned for use in production environment. Among some of the reasons why there was no sign-off was that the systems did not fulfil some of the critical business and user specified requirements and there was outstanding payment of vendor project fees. It was noted by the technical staff, users and management that there was poor quality of system support services post project implementation. The reasons among others being: lack of clarity and official policy on which technical division between the IS and Service Operation was responsible and accountable for administration, support and maintenance of some of the systems: absence of SLAs with the vendor or low category SLAs and inadequate internal system support skills.

5.3 Executive Management Support for IS Projects

Findings in this study suggest that executive management plays both the expected helpful role (refer to Chapter 4 section 4.1) and disruptive role in IS projects. Whereas, the executive management claims it provides the required sustainable financial, administrative and moral support. On the contrary the study suggest that users and staff from the technical departments and some ex-project managers are convinced that the executive management role and support is half-hearted, not universal and focused on putting pressure on the project team to complete the projects at the earliest time possible and cut down on costs. Several reports both case studies and literature reviews for example by Davenport (2004); Mabert et al. (2003); Soja (2006); Loonam and McDonagh (2007) and Shatat (2015) all agree that sustained management support at all project stages is crucial for an IS project's success. Shatat (2015) underline the importance of commitment, including management commitment, in especially the acceptance phase that is when users begin to employ the system.

Shatat (2015) further suggests that project managers need to be supported by top managers in order to create confidence for the project among the end users. Biehl (2007) states that another reason why top management support is needed is to secure financial and human resources for the project.

5.4 How Economic Environment and Corruption Impact IS Projects

The study results suggests that implementation of major IS projects lasting six months or more are more likely to be negatively impacted by unfavourable changes in the country's macro-economic environment. This is exemplified by the experience of the TDN project which was financed by foreign currency denominated bank loan. The negative volatile local currency fluctuations and rising inflation and interest rates increased the value of loan repayment disbursements in local currency and vendor project fees. This led to foreign exchange losses which consequently imply reduced project scope or/and prolonged project schedule and extra project budget costs. This is in contrast to research work in IS projects by individuals and groups for example Nauman et al (2003); CHAOS(2014); Gartner (2000); Project World (2005); Shuhab-u-Tariq, 2010); Oracle White Paper (2011); Taimour (2005) that was mostly done in the developed world where the micro-economic environment is often stable therefore the impact of change in the economic environment of the entities implementing the IS projects was not much discussed or not discussed at all in the research findings.

Similarly the impact of corruption in IS projects is not widely covered in previous related research by individuals and groups like Nauman et al. (2003); CHAOS (2014); Gartner (2000); Project World (2005); Shuhab-u-Tariq (2010); Oracle White Paper, (2011); Taimour (2005). However, in contrast with findings in this study comments from study participants across all demographics indicates that suspected cases of corrupt and dishonest practices among the vendors, management and members of the project team hampers the smooth and successful execution of IS projects and compromises the quality of project outcomes. Among some of the corruption allegations were inaction and no accountability for falsified system test results by the vendors, unfulfilled project specifications by the vendors, inflated project costs and purchase of obsolete equipment.

5.5 Quality of Systems That Come out of IS Projects

The DeLone and McLean IS Success Model (2003) as cited by Perez-Mira (2010) identifies system quality, service quality, information quality, user satisfaction and intention to use as the five key critical dimensions of a successful information systems. Gorla, Somers, and Wong (2010) defines system quality as the convenience of access, flexibility of system, integration of systems while Belardo et al. (1982) adds perceived usefulness of system, response time, reliability, ease of use, ease of learning as other attributes of system quality. Jones and McLeod (1986) states that Information Quality is the quality of information the system produces. Perez-Mira (2010) defines Service Quality as the level of support services from the information services staff and User Satisfaction as the quantity and manner of utilization of the system. User satisfaction is directly impacted by system use, information quality, system quality and service quality.

The findings of this study suggest that the definition of quality system differs among the respondents depending on job position in the company, active role in a particular IS project and business section (Refer Appendix F). User departments characterized quality systems as those that are easy to use, available all the time with good response times and less functional and technical challenges. On the other hand, technical departments described quality systems as those that are easy to maintain and support. Executive management defined quality systems as those capable of driving the business growth strategy and adding value to the business. The study finding suggest that thus far the business and operational systems (most notably the NGN Billing system and OCS) that have emerged out of the IS projects have failed to deliver on quality as expected and described by the respondents, the business and defined in literature.

5.5.1 System Quality

Descriptive statistics from content analysis of interview results shows that 80% , 60% and 20% of the user respondents from the various business sections who use the NGN, OCS and SAP ERP system respectively find the systems not easy to use and navigate. The NGN billing system particularly has difficult human interaction interfaces with many unnecessary and complex process flow steps to execute critical business tasks like customer service registration and activation.

5.5.2 Information Quality

Content analysis of interview results show that 30%, 70% and 95% of the user respondents trust and use the reports generated from the NGN Billing, OCS and SAP ERP systems respectively. The extreme low levels of trust in the reports generated from the NGN billing system was attributed to wrong report requirements provided by the users during requirements gathering and incorrect and inconsistent data migrated from the old billing system to the NGN Billing systems.

5.5.3 System Use

Content analysis of interview results indicates that most of the users (90%) prefer to execute business tasks using the system if the systems are working fine and that they attach great importance to the systems. However, the users are often forced with regret to perform critical and urgent business tasks manually outside the systems when they face technical or functional challenges with the systems. The users may also have no choice but perform some business tasks outside the systems because there are no options in the system to execute some business tasks, for example the registration of customer service accounts for WIMAX and CDMA services in the NGN Billing system. Among the unskilled and semi-skilled staff they said they only use the systems because they are instructed to do so by their superiors otherwise they feel the systems are unnecessary distraction when performing their tasks since they can achieve same results manually. Some (30%) of the users viewed the systems negatively because the systems replaced people and necessitated the re-assignment of tasks they used to do and cherish to staff from other departments. Six months after launch of the NGN billing system some of the users (20%) continued to access and use the old billing system for business transactions and report generation mostly for lack of confidence in the new system due to missing and inconsistent data and the many functional and technical errors.

5.5.4 Service Quality

Service incident reports from IS support service show that there is 35% and 20% system downtime respectively for NGN billing and OCS systems mostly attributed to system functionality failures, technical errors, network connectivity problems, performance degradation, power failure and database related problems. Most of the

user complained of slow and poor levels and quality of support services. This was mainly blamed on unskilled internal IS support team and over dependency on first level of support from off-shore vendor support service teams. The study also show that high labor turnover among skilled company and vendor support staff compromise quality of support services.

5.5.5 User Satisfaction

There is no scientific mechanism to measure actual levels of user satisfaction with the systems however from empirical evidence the many and frequent occurrence of user reported incidents is indicative of the user dissatisfaction with the systems. Interview results of respondents from the user department indicates that 80%, 60% and 15 % of the users respectively expressed dissatisfaction with the NGN Billing, OCS and SAP ERP systems. The higher levels of user dissatisfaction with the NGN Billing and OCS systems is attributed to failure by the users to deliver quality customer services with speed. Dissatisfaction also emanates from the many technical and functional challenges and errors in the systems. Another source of dissatisfaction is the multiple incorrect and unreliable business reports generated from the systems that are not suitable for making correct business decisions and analysis.

5.6 IS Projects Success Rates and Factors

Most of the company's (NGN billing system, OCS, TDN and NGN soft switch) major IS projects under study were classified as challenged projects (Refer to Appendix E) for Characteristics of Challenged Projects) by most of the respondents. Only one, SAP ERP was classified as successful (Refer to Appendix E) and another one CDMA ON Internet as completely failed (Refer Appendix E). The challenged projects failed to meet more than 75% of the specific user, business and technical specifications that were agreed with the vendors in the project scope and contractual agreement. To illustrate this: The NGN Soft Switch was not fully implemented to meet both fixed line and mobile services. The first phase of the project successfully implemented the fixed line component. However, because the company was implementing the NGN Soft Switch project during difficult financial period the second phase for mobile services was not implemented at the time of project closure. Secondly, even for the implemented fixed line component the switch functionality was at less than 75% because the vendor without warning or notice deceptively changed the agreed system

equipment version which drastically reduced the functionality of the NGN Soft Switch by 25%. Furthermore in most cases with the challenged projects there was no sign-off with vendor at project closure and the projects had extended project schedules and scope and had budget overruns. In contrast the successful projects for example SAP ERP met more than 90% of the agreed specifications and were completed within schedule, scope and budget with the right levels of quality. The completely failed projects like CDMA on Internet were either abandoned or not executed at all despite that millions of Malawi kwachas was already spent and committed on the project.

The findings of this study are in line with findings by SGIS (1999; 2003; 2014) which concluded that more than 70% of technical projects fail and that in most industries the bar of expectation for project success has been lowered and accepting project failure has become a norm. The SGIS report noted that successful implementation of the IS projects is not an easy task and the expected net benefits from the IS projects are often not optimal. IT professionals themselves view IS projects as challenging and the attitude is a sort of “we do our best, but ...” companies in general have a long way to go before they fully master their project efforts (ITSM, 2017).

5.7 Impact of IS Projects on Group and Individual Benefits

The study findings suggest that it is difficult to quantify added value of the systems to the company strategic or operational objectives and business goals. There is no viable feedback and mechanism put in place to know how the systems impact and affect the commercial, technical, financial or human resource position of the organization. Moreover, there are many other external factors for example unstable business environment, competition that affect the company's operations and position in the industry other than the investment in IS projects.

Nevertheless, the finding suggest that the case study company has under-achieved on IS projects goals and consequently not benefitted as much as it was expected from the IS projects either at group or individual level. Specifically, the systems have failed to add great value to the commercial activities of the company. For example, the systems like OCS and NGN Billing have not given the business a real competitive advantage on the market or leveraged the production of creative services and products as it was

anticipated. The systems have contributed to customer dissatisfaction, lost sales, shrinking market share and reduced revenue by failing to deliver quality customer services on time. The study found that the systems have failed the business commercially because they are not first on the market, inflexible to adapt to changing business and market demands and trends and normally the competition have better functioning systems. The findings are similar to the research conclusion of Williams and Williams (2007) who argue that information technology is part of a company's competitiveness but if and only if the business has the resources to harness the IS project implementation and the systems that come out of the IS projects to its advantage.

Interview results from respondents in the finance and commercial division and review of available financial records show that the systems generally have had both negative and positive impact and effects on the company's revenue, profitability, liquidity and return on investment. The introduction of the OCS allowed most of the customers to migrate from post-paid services to pre-paid services hence reducing uncollected debt, and operational costs associated with debt collection thereby boosting revenue collection and liquidity. The OCS, NGN billing and SAP ERP systems reduced revenue loss by exposing and closing revenue leakages. However, the same study also show that when the OCS was initially launched there was dramatic loss of customers when customer data service accounts were unceremoniously migrated from post-paid to prepay model. Review of sales records show that at the beginning of 2015 after launch of the OCS the company lost 80% of the sales. Between January, 2014 and January, 2015 sales revenue declined from K404, 000, 000 to K160, 000, 000. The OCS, TDN and NGN billing project all experienced budget overruns which exerted pressure on the company's cash flow position and forced the business to seek additional bank loans thereby increasing borrowing costs and creating lost investment opportunities. Depreciation of the local currency reduced company revenue, profitability and worsened its liquid position due to increased value of capital and interest loan repayments in local currency for the foreign bank loan funded TDN project. Much as the TDN project achieved the strategic business objective of diversification into data and internet, the project did not achieve its revenue and profitability goals and objectives. Revenue generated from the investment in the project was not enough to meet US\$ denominated capital and interest repayments

bank loan in volatile micro economic environment. This loan repayment created working capital problems for the company. To resolve the financial problems, the Fiber Optic Network infrastructure was unbundled from the company and a new company was registered and incorporated to manage the fiber network. Contrary to expectations that accurate billing and timely debt collection after introduction of the NGN billing system will increase revenue actually revenue declined due to persistent system failure to register and automatically provision many customer service accounts therefore accurately bill the service accounts. The total costs of owning the systems post project implementation increased over time due to expensive vendor SLAs, continuous demand and development of new or modified system functionalities and expensive equipment maintenance.

The study findings further show that the systems have a mixed impact on improving the efficiency and effectiveness of executing the company's business processes and tasks. Much as the execution of business processes has improved by streamlining and automating the execution of tedious, routine repetitive tasks. On the negative side the systems have many frustrating technical and functional challenges and errors (notably OCS and NGN Billing) which impede and complicate the execution of some of the business processes. Furthermore not all business processes are catered in the systems therefore some of the business tasks still require manual intervention to be completed. However, despite the many challenges associated with the systems, the users value the systems as important tools in assisting with the execution of critical business tasks.

These findings are consistent with the results reported by Mukherjee (2002) who argued that information technology overall have a greater impacts on organizations and in case of large information systems the systems may actually influence ways of working and shape the business processes. Cameron and Green (2009) also argued that it is worth underlining how crucial it is to understand the proximity of business processes and information systems and consequently align business management and IS projects. According to Rajapaksha and Singh (2012), fitting systems to business processes is often a better option than customizing complex business systems. This research reaches contrasting conclusions in that the customization of the vendor systems to suit the company's user and business requirements has not addressed all

needs of the organization's business processes and even complicated some of business tasks.

The study findings suggest that the systems affects the social and human factors in the organization by contributing to discontent, conflict, the tendency to shift blame and truancy among employees. On the other hand, the systems have been enablers that changed the company business's strategy, models, culture and structure and to suit new business direction driven by the systems. Nevertheless, the influence of the systems is very modest because the company's structure and culture are too rigid to change things by the mere introduction of systems without serious direct executive management intervention.

5.8 Data Cleanness and Its Impact on System Functionality and Information Quality

The study results suggest that there is a direct relationship between the quality of data stored in the systems and the accuracy, usefulness, timelessness and relevance of reports generated from the systems and how well the systems functionalities work. Research work by Jern (2009) observed that data cleanliness is not considered a critical success factor in IS projects and was ignored in previous research. Jern (2009) findings further suggest that there is need to give more time and resources to issues of data quality during IS projects. The findings of this study concurs with those of Jern (2009) however they go further to conclude that the cleanliness of data collected and migrated during IS projects is a key factor that determines the quality and success of business and operational systems that come out of IS projects.

5.9 Summary of Research Results

In respect to the objectives in this study, the results showed that the way the case study company conducts the initiation, planning, control, execution and close-out information services (IS) projects and collect and migrate data determines the quality of the projects' outcome systems. The project activities are affected by common project pitfalls and most of the majors IS projects have been challenged. Consequently the quality of the system that come of out of the information services projects influences the company's anticipated group and individual benefits accruing from implementing the projects. The Study further show that this influence

notwithstanding that it is not exactly quantifiable, based on respondents general comments across all demographics it is often negative than positive.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter draws the research conclusions based on the interpretation of the research findings and discussion. It also makes recommendation on how the case study and others can improve on the conduct of IS projects. The recommendations are made based on data collected from respondents' interview transcripts, document analysis and from literature review. In cases where the recommendations have already been considered they will act as useful reminders.

6.2 Conclusions

The primary conclusion from the study is that even though study results are not confirmatory in terms of direct cause and effect relationships. However, there is a better understanding of the three way causal relationship among conduct of IS projects, quality of systems that come out of the IS projects and the expected net benefits from the systems. The study further concludes that the quality of the systems that come out of the IS projects implemented by the company is compromised because the project activities of initiation, planning, control, execution and closure are ineffectively and inefficiently done. The company implements large complex systems however it fails to provide the required and appropriate technical and people skills and financial resources. It is concluded from the study results that because of the poor quality of the systems the company has not benefitted much from the investment in IS projects. There has been no marked improvement in revenue, profitability, market share and customer satisfaction as it was envisaged in the project's financial appraisals and business case. Moreover, the levels of improvement in the execution of business processes do not match the users and business expectation that were there at the time of initiating the projects. However, it is to be noted that some net benefits

accruing from IS projects are not quantifiable because of the lack of information, measuring mechanism and political will.

Secondly, it is concluded from the research data that the IS projects thus far implemented by the company are mostly challenged because of the prevalence of scope, schedule and budget overruns and project quality issues. Dishonesty, corruption, over-reliance on foreign vendors, and cash flow constraints are other known factors that contribute to project challenges and failures in the organization.

6.3 Recommendations

To enhance the conduct of IS project management in order to build quality systems that will benefit and add value to the business the researcher makes the following recommendations based on the current study findings.

- a) The initiation and planning of major IS projects should be driven by an ad hoc committee comprising of internal and external teams with technical expertise and business knowledge in the project domain.
- b) Staff from the user department with business knowledge of the project domain should be involved as key stakeholders at all stages of the projects life cycle and be incorporated in project teams.
- c) All project activities, most importantly the vendor evaluation exercise should be transparent, collaborative, rigorous, inclusive and independent of undue executive management interference.
- d) Choice of vendor systems should be driven by viability of the vendor existing systems, vendor position and reputation on the market and the flexibility of customizing vendor systems on client site to suit their business requirements
- e) There must be a formal plan and method to periodically communicate to all key stakeholders at all stages of project implementation.
- f) Implementation of any major IS projects should only commence after assurance that funding will be sustainably available during the entire project lifecycle.
- g) The implementation of parallel multiple, ambitious and complex projects should be avoided at any costs to avoid diversion and overlap of funding.
- h) Training of users and IS support staff should be adequate, meaningful, practical and broad based. There should be contractual commitment on vendor

to genuinely transfer the required levels of system knowledge, skills and competencies to company staff.

- i) System testing should be conducted in simulated production environment that reflects the actual system functionalities, data, format and configurations and be broader, exhaustive in scope, time and focus
- j) Collection, analysis and migration of data into new systems should be done by company staff who understand and use the business data with support of consultant expertise
- k) To deal with significant changes, anomalies and variances while project is on-going there is need to have and enforce quality assurance and control and change management plans incorporated in the business case document,
- l) There should be a post project implementation audit and review to quantifiably assess if the financial and technical appraisal targets that justified the project are achieved and to derive lessons if targets are not achieved
- m) To reduce the frequency of user system rejection hence increase impact of systems on individual, groups and the business as whole there is need to increase user participation in project activities and minimizing the many technical and functional challenges associated with new systems.
- n) The business should focus on building systems that are fully integrated such that a transaction generated from one system should reflect in all other interrelated systems with same consistent accurate results
- o) For increased business and customer impact there should be vibrant customer awareness campaigns and support services before and after launch of new systems. A mock test should be carried out to assess any anticipated customer feedback, market reaction and behavior to the new systems.

6.4 Further Research

There is need for further research on what is quantifiable and exact added impact and value of information systems on a business's financial and market indicators in developing nations. The researcher failed to establish this during the study because of the lack of post-project appraisals and reviews by the Case Study Company, limited access to required data and unavailability of relevant data to carry out this impact analysis.

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APPENDICES

Appendix A: Semi-Structured Interviews

Interview Code:

Business Function/Division:

Date of Interview:

1. Introduction

- Introduction and greetings
- Ask for permission to record the interview
- The purpose of the interview clearly explained.

Objectives of research

The main objective of this study to evaluate what is the relationship among the conduct of IS project management, the quality of the systems that come out of the IS projects and the net benefits on a business entity implementing the IS projects. The specific objectives are as follows: (a) Identify major IS project challenges likely to impact system quality and net benefits. (b) Determine the success factors and rates of IS projects.

Benefits and Justification

The benefits of the research: Theoretically the research will generate knowledge that will enable researchers and practitioners to understand project management challenges that lead to failure of many of IS projects in the developing nations of Africa in general and Malawi in particular and the consequences of failed IS projects on the implementing entities. Practically from the generated knowledge it is hoped that MTL and other business entities will derive lessons learned from the study and implement best practice for future IS projects.

The data gathered will be kept confidential and will be processed with secrecy. I will be glad if you kindly answer all questions.

2. Participant Basic Information

Occupation.....

Gender.....

Work experience (Number of Years)

Age.....

Highest Qualification.....

User or Non User.....

Business Division and Section.....

2. Interview Questions - adapted from Adeleye (2002) cited by Demaria (2011)

2.1 User Interview Questions

1. Have you ever participated in any IS projects activities? If Yes Briefly explain your role experience and with the project implementation
2. How can the company improve on future implementation of IS projects?
3. How have the systems affected your business division and section?
4. In the course of doing your job how much importance do you attach to the current business systems and what motivates or demotivates you to use the systems?
 - As an attitude
 - As a behavior
 - Company says so
5. How easy is it to use the systems? Explain more
6. Are you satisfied with the company's information systems? Explain your answer either way.
7. Do the systems affect your job performance and appraisals? If YES explain how whether negative or positive or both
8. Do you think the organizations information systems have affected the organization's culture and structures? If YES briefly explain how
9. Has the information system directly affected your social and personal and group behaviors in the work environment? If YES explain how whether negative or positive or both

10. Has the Information systems affected your work environment? If YES explain how whether negative or positive or both yes.
11. After being trained in a new system did you feel confident about your abilities to use new system? Explain why in either case
12. How do you rate the quality of information systems in terms of system quality, information quality, system use, user satisfaction and service quality

2.2 Project Teams And Technical Staff Teams Interview Questions

2.2.1 Project Management Questions

1. Who initiates and how are IS Projects initiated.
2. Have you ever participated in any IS Project. If yes state the project/projects, define your role and activities you participated in the project/projects
3. What are the major documentation produced during the project implementation stages of initiation, planning, execution? and closure and explain purpose and content
4. What type project risk assessment and planning is carried during IS project planning?
5. Briefly describe process for selecting system vendors and what are the key deciding factors?
6. How were the project manager/managers and teams selected?
7. What are the standard project methodologies and tools adopted when implementing IS projects and why?
8. What and how has been the role of executive management in IS project
9. What type of feasibility studies are carried during project planning?
10. Outline and describe the major challenges faced during the implementation of the project/projects.
11. How do you deal with conflict, change management people management in IS Project?
12. What the IS project risks and define the method of monitoring quality and risks during project implementation planning and mitigation project progress
 - Informal
 - Formal
 - Ad Hoc
 - Automatic

- ** Explain your Choice above
13. What type of tests are carried during project implementation and how effective are the tests?
 14. What type of training is carried out during project and satisfactory is the training?
 15. Do you measure user satisfaction with the information systems? If yes define:
 - Measures
 - Criteria
 - ** If you do not measure explain why?
 16. How successful were IS Projects implemented by the company that you are aware of or participated in and why do you rate the project/project as such?
 17. Post project implementation do you do project close out meetings. If YES. What issues are discussed and documented?
 18. Do you think the below issues has any influence on implementation of' information systems project implementation?
 - Organization's culture; If YES briefly explain how
 - Organization structures: If YES briefly explain how

2.2.2 Information Systems Questions

1. Describe how you rate the system quality?
2. What method should be employed to implement IS projects?
3. How have the systems impacted your job and performance?
4. What are the level of individual and group participation of your team in the IS project implementation
5. What type of training you get in new systems and how satisfactory is the training?
6. What challenges do you face in supporting and administering the systems?
7. Who is responsible for support, administration and maintenance of system post project implementation?
8. What are levels and quality of vendors system support?
9. How do you measure user satisfaction with the information systems? If yes define:
 - Measures
 - Criteria
 - ** If you do not measure explain why?

2.3. Management Interview Questions

1. What are the strategic goals of the business? (In relation to your section)
2. Do IS projects align with strategic business goals? If yes how? And If not state how they should be aligned with strategic business goals?
3. Who initiates IS projects and why? And who should initiate IS projects and why?
4. What is the role and levels of leverage of executive management in IS projects? And how sustainable is the role?
5. How do the following changes affect IS project? Is there action plan to deal the changes?
 - Change in executive management
 - Change in organization structures and business processes?
 - Change in business economic environment
 - Change in business financial situation
6. What has been the long term impact on the business by IS projects? e.g. financial, market, employee, structures and culture. (based on section)
7. At corporate level how do you define information system quality? And have the IS projects delivered on system quality?
8. What method should be employed to implement IS project and why? e.g. outsource

3. Conclusion

Interview review, Comments and Questions

4. Appreciation

Thank the participant.

Appendix B: University of Malawi Consent Letter



PRINCIPAL

Richard Tambulasi, B.A (Pub Admin), BPA (Hons), MPA, Ph.D

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20 October 2015

TO WHOM IT MAY CONCERN

Mr Robert Chimalizeni, Registration Number MSC/INF/28/14 is student at Chancellor College pursuing an MSc in Informatics under the Computer Science Department.

Mr Chimalizeni would like to conduct research for his thesis. Any assistance rendered to him for the same would be greatly appreciated.

Yours Faithfully

Kondwani G. Munthali (PHD)

Coordinator, MSc Informatics

Kmunthali@cc.ac.mw – 0999387701

Appendix C: Request to Participate in a Research Interview

Dear Participant,

Request to Participate in a Research Interview

I am a student in MSc in Informatics, A University of Malawi, Computer Science Department, master's degree program. I am in a process of collecting data for my thesis. The research is entitled. **“How Information System Projects Impact the Quality and Net Benefits of Business Systems.”** Focus of research is the telecommunication industry and your employer is the case study

I have obtained consent letters to study at case study company and an approval from the University of Malawi to perform study. You have been selected to participate in an in-depth semi-structured interview targeting users of the company's business information systems

The interview will take approximately 1 hour and will be recorded.

Your benefits for participating in the study are enhanced understanding of information system projects, contributing better to the process and improving the way you perform your job tasks using information systems. The potential benefits to science, business and humanity resulting from is better understanding of casual relationships among information systems projects, quality of business systems and expected benefits and future best practice for Implementing IS projects.

Participation is strictly voluntary however since the validity of the results depends on you giving your honest opinions, values, perceptions, observations, cultural, organizational structures and processes you are required to be open minded and forthcoming during the interview and your participation is crucial to the success of this study

Please be assured that your responses will be held in the strictest confidence, if you have any question or seek clarification contact 0111968879 or robert.chimalizeni@mtl.mw and robert.chimalizeni@gmail.com

Thank you for taking the time to assist me in my educational endeavors.

Sincerely,



Robert Chimalizeni

Appendix D: Project Initiation Documents

Table E1. Project Justification Documents

Document	Purpose	Content
Business Case	It is a motivation and justification document that answers the question why should business invest in the project	• Project Challenges • Proposed Solution • Alternative Solution • Project Outcomes and Opportunities • Stakeholder List • Project Execution Plan • Project Scope • Project Charter
Control Form	It is used to assess the project viability for approval and contains all the projects financial details that answers the how question	• Monthly project allocations • Sources of funds • Entities to be paid • Total project costs • Expected revenue • Return on investment • Break-even point • Project budget • Net present value • Internal rate of return • Project Schedule • Capital expenditure items

In addition there is the legally binding Project Contract Agreement document which is signed by vendor and client for adherence to what is prescribed in the contract. However most of respondents expressed doubts if the contract agreements is worth the paper it is written on because the vendors are not held accountable for contract violations.

Appendix E: Projects Success Categories and Rates

Table E1: Categorization of IS Projects
Source: Respondents Interview Results

Project Category	Characteristics of Project and System
Successful Projects: 1. SAP ERP Business One 2. The Old IN 3. AAA	• The system fulfilled most of the specified user and business requirements • The systems were a great improvement over the previous similar systems in terms of reporting, execution of business processes and capabilities for multi-user access? • 75% of the outcome system functionalities were working as expected • The project team members and other projects stakeholders directly involved in the projects were experienced experts in the project domain • The project team drew lessons from similar previous projects. • There was a clear and well formulated Request For Proposal Document (RFP) • The vendor evaluation exercise was transparent • There was sustainable project funding throughout project lifecycle • There was sustainable executive management support throughout project lifecycle • There was wide and extensive user and support staff training • The users were involved at all project stages throughout the project lifecycle • The users took ownership of the projects and outcome systems
Challenged Projects: 1. TDN 2. OCS 3. NGN Post-Paid Billing 4. NGN Soft switch	• The projects were huge and complex • The outcome systems did not generate the expected revenue many years after the projects were implemented • The outcome systems had many functional, technical and integration failures and errors • The outcome systems had many missed or misconfigured user and business requirements • The outcome systems were not user friendly and difficult to navigate • The outcome systems had many malfunctioning or non-working modules many years after go live
Failed Projects: 1. The CDMA Phase IV 2. HR and VIP Payroll 3. Revenue Assurance & Fraud Management	• Some expenses were incurred but the projects were subsequently cancelled • There was technical feasibility challenges with the projects • There was lack of sustainable support from new executive managements • There was funding problems • There was general ignorance of the significance of systems that do not directly contribute to revenue generation.

Appendix F: System Quality Attributes

Table F1: Attributes of Quality System by Business Function/Division
Source: Respondents Interview Results

Demographics	Attributes of System Quality
User Departments	• Good response times • Available 99.99% of the time • Meets original user and business specifications • Easy to use and navigate • Stable with less functional and technical challenges • Having logical business process flow steps • Generates analyzable current and historical reports in right and correct format • Configure quality and innovative services and products
Technical Departments	• Easy to add new functionalities • Easy to modify existing functionalities • Minimal or no functional errors • Integrates and integrated with existing systems and technologies • Scalable with future systems and technologies • Easy to support and maintain by the company's internal staff with escalation to vendors • Preserves data integrity • Good throughput and performance • Secure
Executive Management	• Drive the business growth strategy • Expand customer network • Leverage creation of new products and services • Give the business competitive advantage • Add financial value to the business

Appendix G: IS Projects Success Factors

Table G1: IS Projects Success Factors by Business Function/Division

Business Function/Division	Success Criteria of What is a Successful Project
User Departments	The systems should:
a. All user departments	• Radically improves the efficiency and effectiveness of executing the business tasks thereby reducing employee workload • Have a few technical and functional errors • Be easy to use and navigate • Meet more than 90% of system functionalities as per SRS documents • Have more and better functionalities than existing systems • Produce timely, accurate reports in the correct format and usable for analysis and decision making • Contribute to employee group and personal benefits • Easily and consistently interface and integrate with each other to share and exchange data
b. Sales/Service Centers	• Have few or no user reported incidents once are in production
c. Marketing/Innovation	• Assist to improve the quality of customer service delivery
d. Finance	• Allow the business to create differentiated innovative products and services • Give the business a competitive advantage on the market • Add value to the business by increasing revenue streams, profitability and liquidity
Technical Departments	• Systems that are adaptable and scalable to changing future technology • Systems that can co-exist with current systems • Systems that are easy to maintain • Systems that are easy to support
Project Team	• Project deliverables are achieved within budget, schedule, and scope and have quality • Having 60% of the project team members coming from the user departments
Executive Management	• Systems that drive the business growth strategy and financial benefits

Appendix H: Project Risks

Table H1 Summary of Projects Risks by Category
Source: Respondents

Risk Category	Risk Type
Technical	• Lack of or inadequate technical appraisals • Poor system design • Lack of or inadequate use of project methodologies • System integration failures • Project scope changes • Poor testing
Financial	• Inadequate or unavailable funding for project budget funding • Under estimated project budgets and budget overruns • Volatile micro economic environment • Cash flow problems
Human and Social	• Schedule overruns • High labor turnover • Lack of internal skills • Poor project planning • Poor change management • Lack of user involvement • Inadequate training