AN ASSESSMENT OF THE IMPACT OF INFORMATION SYSTEMS ON ORGANISATIONAL PERFORMANCE IN TELECOM NAMIBIA

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ABSTRACT

Information systems (IS) play a crucial supportive and transformational role in organisations. This research sought to assess the relationship between information systems and organisational performance at Telecom Namibia (TN). To achieve the objectives of the research, a mixed method approach was used. Quantitative data was collected using a semi-structured questionnaire, whilst qualitative data was collected through semi-structured interviews. The sample for this research comprised of permanent employees at TN in the Windhoek vicinity, which was 150. The questionnaire was administered electronically. Eighty-one (81) of the sample responded to the questionnaire, resulting in a response rate of 54 percent, which was considered as a sufficient representation of the population. Interviews were conducted with purposively sampled managers who had been at TN for more than 10 years. The research findings revealed that the majority of the respondents had access to various IS to enable them to perform their duties. The findings also revealed a positive relationship between information systems use and organisational performance at TN. Organisational performance was considered in terms of user performance and the four domains of the Balanced Scorecard (BSC) namely: customers, financial performance, internal business processes, and learning and growth. The researcher recommends that organisations should embrace IS to have a competitive edge and improve service delivery to their customers. The researcher also recommends that future studies be based on larger samples of employees drawn from a broad range of organisations.

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ACRONYMS

AA	-	Automatic Activation
ADSL	-	Asymmetric Digital Subscriber Line
BSC	-	Balanced Scorecard
CAPEX	-	Capital Business Expenditure
CBS	-	Converged Billing System
CRM	-	Customer Relationship Management
DWDM	-	Dense Wavelength Division Multiplexing
EMS	-	Element Management System
ERP	-	Enterprise Resource Planning
ESS	-	Employees Self-Service
EXCO	-	Executive Committee
GDP	-	Gross Domestic Product
ICMS	-	Integrated Customer Management System
ICT	-	Information Communication Technology
IT	-	Information Technology
ITEL	-	Institute for Technology-Enhanced Learning

IS	-	Information Systems
IMBOK	-	Information Management Body of Knowledge
KPI	-	Key Performance Indicators
MD	-	Managing Director
NGBSS	-	Next-Generation Business Support System
NMS	-	Network Monitoring System
NPTH	-	Namibia Post and Telecom Holdings
OPEX	-	Operational Costs
PMS	-	Performance Management System
SADC	-	Southern African Development Community
SAP	-	Systems Applications and Products
TAM	-	Technology Acceptable Model
TN	-	Telecom Namibia
TNMS	-	Transport Network Management System
WIP	-	Work in Progress
WOMS	-	Work Order Management System

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DEDICATION

I dedicate this research project to my family for their support and understanding during the entire process of the research project. I will forever remain grateful.

DECLARATION

I, Letty Namwoonde, hereby declares that this study is my own work and is a true reflection of my research, and that this work, or any part thereof has not been submitted for a degree at any other institution.

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Student's Name	Signature	Date

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the study

The telecommunications industry is very dynamic, and organisations are expected to deal with the technological changes and adapt to the new way of doing business (Beshtawi & Jaaron, 2014). Likewise, the telecommunications industry is highly competitive, and providers are continuously looking for strategies that would enable them to perform better than their competitors (Akar & Mbiti, 2010). Equally, the telecommunications and service delivery sectors are characterised by rivalry and alternative service providers, customers have options to select from the available service providers (Njoronge, Muathe, & Bula, 2016). Njoronge, Muathe and Bula (2016) further highlight that for an organisation to improve its performance, it must comprehend and ascertain its resources that will help it maintain and improve its competitiveness and sustainability. Amongst others, technology as an intangible resource leads to better performance as it helps organisations formulate and implement strategies that can advance efficiency and effectiveness (Barney, 2011). As a result, organisations are increasingly using information technology (IT) and information systems (IS) to develop solutions to business problems, advance productivity and service quality, compete for new markets, as well as improve on the efficiency and effectiveness of the decision-making and business processes (Kariuki, 2015). Organisational performance represents the way in which the business is organised to reach its objectives and the way it reaches them (Kariuki, 2015).

1.1.1 **Information Technology (IT) and Information Systems (IS)**

Information technology (IT) refers to the technical components, typically organised as hardware, software and communications, used to make up an information system (Bytheway, 2014). However, the technology (IT) itself is useless, unless it is engineered into information systems (IS) that consist of hardware, and all the components of a working system as well as the staff working with the system to deliver output to meet the needs of the business (Bytheway, 2014). IT is not the same as IS, but it is the building blocks with which we work. As a result, business organisations have engineered IT and implemented IS and other solutions as part of their IT/IS strategy to meet the business strategy as highlighted by the Information Management Body of Knowledge (IMBOK) framework (Bytheway, 2014). IS are applied to improve business processes and bring data to the business that becomes useful as business information (Bytheway, 2014). Furthermore, the business processes and business information are fundamental to how an organisation is seen and operates. Again, most businesses have a strategy that guides and directs their efforts, even though the quality of the strategy varies. Furthermore, IT must be aligned to the business strategy to address the business needs, by engineering it into IS and other applications (Bytheway, 2014).

1.1.2 **Organisational Performance**

Organisational performance is defined as the accumulated results of all the activities and processes in an organisation (Hailu, 2014). Likewise, performance is defined as a measure of productivity (Zehir, Yilmaz, & Velioglu, 2008). Despite the several measures of organisational performance, these measures can only be evaluated with

qualitative and quantitative criteria (Zehir, Muceldili, Akyuz, & Celep, 2010). Organisations assign their resources differently in order to maximise their objectives and their performance is proportional to the amount of IT enabled resources they assign (Kariuki, 2015). In order to achieve high organisational performance, organisations need good information systems and other IT-enabled applications, governed by good IT practices (Mwania & Muganda, 2012). Therefore, organisations invest heavily in IT and related IS as it is perceived to link the business model and the critical drivers of success. However, some are still unsuccessful due to poor alignment of technology with the business (Kariuki, 2015). Moreover, organisational performance is assessed to determine whether the organisation has reached or even exceeded its expected targets, and whether the financing choices made were rational or not (Hailu, 2014). Bytheway (2014) revealed a performance measurement framework called the Balanced Scorecard (BSC) introduced by Kaplan and Norton (1996). This framework maps an organisation's strategic objectives into four performance perspectives, namely: internal processes, learning and growth, customers and financial perspecives (Bytheway, 2014). The research has adopted the BSC framework for performance measurement.

1.1.3 **Telecom Namibia**

Telecom Namibia (TN) Limited is the national telecommunications operator, established in August 1992 and wholly owned by the Government of the Republic of Namibia (Telecom Namibia, 2017). TN is serving over 190,665 customers, with 986 employees and annual turnover of over N$ 1.5 Billion (Telecom Namibia, 2017). TN has presence in all the fourteen regions of Namibia and has eight (8) different Business Units.

TN runs the largest digital telecommunications network in Namibia and it is the leading supplier of voice, text, data and video solutions. Furthermore, it is a customer-driven company that offers telecommunications products and services to the demands of its customers (Telecom Namibia, 2017). Today customers want fast, reliable and advanced services and it is TN's responsibility to deliver these services. IT is known as a business enabler and TN has implemented various IS initiatives that are aligned with its business strategy to meet customer demands. Each initiative is meant to address a specific need, thus spending on IS should help TN realise its goals such as increase in revenue, operational efficiency, and customer satisfaction. Some of the IS implemented at TN include the billing system, SAP system, the Work Order Management System (WOMS), Call Centre System and the Business Intelligence (BI) system. The next section focusses on bringing out the problem that this research has identified.

1.2 Statement of the problem

Over the years, Telecom Namibia has grown as an organisation, which has involved a change in its products, services, processes, and operations (Telecom Namibia, 2017). Equally, there has been massive growth in the number of technological devices used by Telecom Namibia employees and huge investments on IS to improve data management, target achievement, operational efficiency, and service delivery (Telecom Namibia, 2017). In IS business-related studies, researchers are motivated by the desire to understand how and to what extent the application of IS within organisations leads to improved organisational performance. There has been a need to find out if the application of information systems is positively influencing organisational performance at Telecom

Namibia and this is the essence of the research. The expected changes in organisational performance include lower costs, improved business processes, reduction in the time taken to execute critical tasks, information availability and elimination of repetitive tasks, resulting in higher productivity and efficiency as well as not only better but also quality service delivery. The expected changes mentioned above are components of the Balanced Scorecard (BSC) framework. It is against this background that the purpose of the research is to determine the impact of information systems on organisational performance at Telecom Namibia.

1.3 Research questions

The purpose of the research is to assess the impact of IS on Organisational Performance at Telecom Namibia Limited. The following research questions were considered:

i. How do we measure IS impact on Organisational Performance at Telecom Namibia?

ii. Is there a positive relationship between IS and Organisational Performance at Telecom Namibia?

1.4 Presenting the Research Framework

The ability of an organisation to capitalise on the benefits offered by IS became the key motivator of this research, which aims at assessing the relationship between IS and Organisational Performance. The research framework (Figure 1.1) adopted two

components: the Information Management Body of Knowledge (IMBOK) and the Balanced Scorecard (BSC). The IMBOK framework is used to establish the relationship between IT/IS and performance, while the BSC framework is used to assess organisational performance. The above-mentioned frameworks will be discussed further in the next chapter.

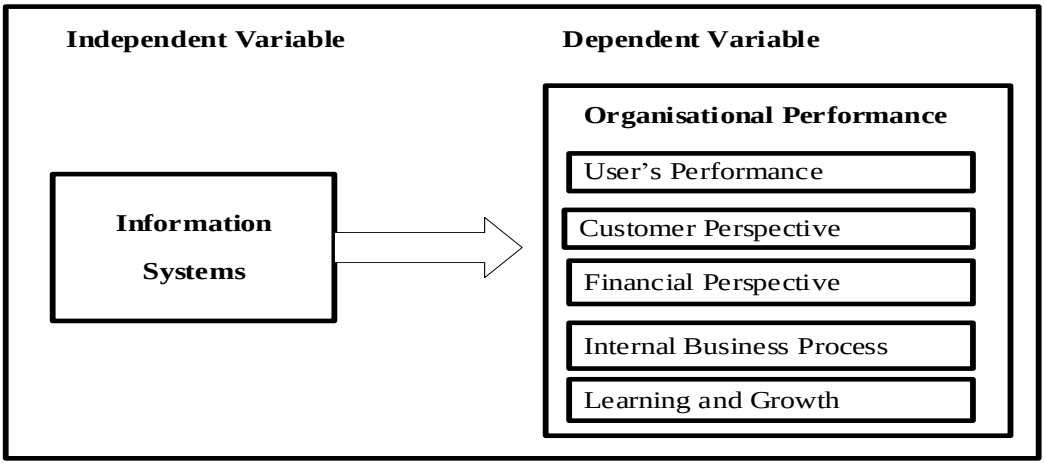

Figure 1.1: The Research Framework

Source: *Researcher's Construct*

With reference to Figure 1.1, the research seeks to explore the statistical relationship between IS and the four perspectives of organisational performance as outlined by the BSC framework namely: financial, customer, learning and growth, and internal business processes. Another domain of the user's perspectives was added in addition to the four BSC perspectives. Consequently, the following hypotheses were framed:

- $\mathbf{H_{1.0}}$: Information Systems do not have a positive impact on user performance.
- $\mathbf{H_{1.1}}$: Information Systems have a positive impact on user performance.

- $\mathbf{H_{2.0}}$: Information System do not have a positive impact on customer satisfaction.
- $\mathbf{H_{2.1}}$: Information Systems have a positive impact on customer satisfaction.
- $\mathbf{H_{3.0}}$: Information Systems do not have a positive impact on financial performance.
- $\mathbf{H_{3.1}}$: Information Systems have a positive impact on financial performance.
- $\mathbf{H_{4.0}}$: Information Systems do not have a positive impact on learning and growth.
- $\mathbf{H_{4.1}}$: Information Systems have positive impact on learning and growth.
- $\mathbf{H_{5.0}}$: Information Systems do not have positive impact on internal business processes.
- $\mathbf{H_{5.1}}$: Information Systems have a positive impact on internal business processes.

Using the Statistical Package for Social Science (SPSS) computer programme, the statistical analysis of the model involved two steps: Descriptive statistics, and one sample t-test inferential statistics analysis to test the hypothesised associative relationships. The methodology, empirical part and findings are extensively discussed in chapters 3-5.

1.5 Significance of the study

Empirical review of literature revealed to the researcher that there are no known studies that have been conducted to assess the impact of IS on organisational performance

of telecommunications companies in Namibia. Therefore, the findings will serve as an addition to existing literature and knowledge, and a stepping-stone for further study on the topic. Furthermore, the findings can be used by Telecom Namibia's management as a base to review organisational performance and make necessary adjustments to improve performance within the organisation and boost operational efficiency. Additionally, the findings can be beneficial to Telecom Namibia in developing strategies for adopting information systems successfully and setting standards that should work towards improvement of service delivery.

1.6 Limitations of the study

The research was undertaken within a telecommunications environment, for a company that is responsible for providing innovative IT services to the nation. This may not be appropriate for the other businesses that are not like TN, so generalisation to other entities may be difficult. Additionally, not all the targeted participants responded to the survey, only the willing participants.

1.7 Delimitations of the study

The research was only carried out on TN employees that are permanently employed and work within the vicinity of Windhoek but excluded the external customers and other TN employees outside Windhoek. In terms of the customer perspective of the BSC framework, the researcher assumed that, most if not all the TN permanent employees are customers of TN as well and are all treated the same in accessing and using TN services, hence the exclusion of external customers. In addition, for this research the

IMBOK framework explicitly eliminated IT from further discussions and provided the basis for focusing on IS. Furthermore, time was also another delimitation factor.

1.8 Outline of the Thesis

Chapter one introduces the thesis, presents the research background, the problem statement, research questions, and potential significance of the research efforts. Chapter two reviews past literature pertaining to the research and introduces the theoretical framework for the research, formulation of the research propositions and hypothesis. Chapter three describes the methodology; it details the research designs, sampling technique, instruments of data collection, and the statistical techniques for analysing the data. Chapter four presents descriptive statistics analysis, correlation analysis and discussion of the findings. Chapter five summarises the major findings, conclusion, recommendations and direction for future studies.

1.9 Summary

This chapter introduced the research, described the problem and the presented the research questions. The chapter further explained the value of the study and summarised the structure of the thesis. The next chapter provides a review of the literature and key theories related to the research.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of previous studies. Specifically, the literature review focuses on the variables of the research. The discussion includes information systems (IS) as an influencing variable, theories, organisational performance as the dependent variable, conceptualisation of organisational performance dimensions as defined by the Balanced Scorecard (BSC), and the formulation of the research propositions and hypothesis resulting from the association of the dimensions of the research model. The chapter concludes with a summary of the literature findings.

2.2 Information Systems

The business environment is no longer stagnant, it is constantly changing because of innovation to discover solutions and introduce new platforms in response to customer demands (Ralabandi, 2014). According to Al-Hameedi and Al-Abeed (2009) in the past organisations, used traditional methods using paper work and files to store data. However, in the case of telecom companies the traditional methods are no longer relevant, because telecom companies store information of more than one million customers (Al-Hameedi & Al-Abeed, 2009). This has necessitated telecommunications companies to make use of IS to support them handling the vast amounts of information required by employees and management (Al-Hameedi & Al-Abeed, 2009). Likewise, Sharma and Khanna (2012)

stated that the purpose of information systems is to boost the overall performance of an organisation through the effective use of information technology and its applications. Al-Mamary, Shamsuddin, and Aziati (2014) pointed out that there is a variety of information systems in today's business environment, although each system plays a different role in the organisation.

Al-Mamary, Shamsuddin, Hamid and Al-Maamari (2015) revealed that the most frequently used IS in telecommunications companies are inclusive of financial, accounting, human resources, billing, and customer relationship management systems. Bal, Bozkurt, and Ertemsir (2012) pointed out that in the telecommunications companies, information related to employees is gathered, recorded, examined, and retrieved using human resource information systems. Furthermore, the human resource system aids in recognising prospective employees, sustaining records on existing employees, and crafting various programs to improve employees' skills and talents (Bal *et al.*, 2012). Information related to company transactions, payroll records, and customer receipts is incorporated and can be retrieved from the accounting information system (Bal *et al.*, 2012). Similarly, details about the organisation's monetary assets such as bonds, stock, and cash are managed through a financial information system (Munteanu, Zuca, & Tinta, 2011). Equally, the billing system is perceived as one of the key competitive weapons in the telecommunications industry, because it encompasses the software, hardware, the network itself and the staff that operate the system (Romanus, 2014). In addition, the billing system contains details of customers' products, services and payment records. Furthermore, reports can be extracted for decision-making purposes (Romanus, 2014).

Thouin, Hoffman, and Ford (2008) pointed out that IS helps businesses to improve decision-making and enhance the effectiveness and efficiency of several important business processes. The numerous benefits of IS include cost saving, promoting better production, reduced delivery time, better customer service, improved innovation, entering new markets, and improved market share, which lead to improved performance (Thouin *et al*., 2008). In the same vein, Thouin *et al*. (2008) stressed that it is worrisome that businesses still spend huge sums of money acquiring new information systems, while the possibility of a negative return on their investment still exists. Furthermore, it is deemed easy to notice the cost of IS failures compared to their successes (Thouin *et al*., 2008).

Information systems are deemed to support organisations in accomplishing their targets by providing insight regarding the company operations to manage its resources better (Babu & Sekhar, 2012). Equally, IS can provide accurate and relevant information to the right people, in a correct format and in a timely manner. Although companies make use of IS to gather, process, store, and retrieve information with the aim of improving performance, some users are still not satisfied with using the systems, whereas, some do not see the usefulness of these systems (Saeed, Lodhi, & Iqbal, 2014). Similarly, insufficient support from top management and training are other aspects that contribute to the negative impact on performance even in the presence of IS. In spite the use of IS, there are other factors that can negatively influence performance, one of them being employees' absenteeism as it reduces the manpower required to execute the tasks, prolongs the service delivery time, wastes financial resources, and interrupts the workflow which in turn affects productivity and services offered in the telecommunications industry (Belhaj, 2012). This is supported by Sultana, Irum, Ahmed, and Mahmood (2012) who identified training as

another reason why organisations are still failing to get the most out of IS use especially in the telecommunications industry, despite the numerous benefits. Sultana *et al.*, (2012) emphasised that through training of the right people, an organisation can improve its employees' skills and competencies. Because of training, organisations are enabled to embrace change brought about by technological innovations.

The main objective of a business is to maximise profit in terms of increases either in business productivity or by achieving rapid expansion in market shares (Kilonzo, 2012). To achieve this goal, Kilonzo (2012) suggested that businesses need to be responsive to environmental changes, especially the information technology revolution. Presently, information technology is necessary in many businesses, as it is difficult to gain competitive advantage and survive without adapting to the advancement of technology to a certain extent (Kilonzo, 2012). Studies have shown that the most commonly used information system is the accounting information system (AIS), particularly in financial reporting aspects (Ismail & King, 2007). AIS is defined as a system that process data and transactions to provide users with information required to plan, control and operate their businesses (Kilonzo, 2012). Equally, AIS are systems that management use to carry out their roles of planning and control processes by providing relevant and reliable information for decision-making (Kilonzo, 2012). Therefore, full adoption of an information system is important to achieve the system's benefits. On the contrary, other studies pointed out that some businesses are still faced with ineffective information management, poor system control, and most decision making is done on an ad-hoc basis despite having adopted IS (Kilonzo, 2012).

Although, companies in the telecommunications sector use IS, there are still mixed feelings towards the systems, whereby some staff are dissatisfied with the systems, while others believe the systems are not useful (Al-Mamary *et al*., 2015). Furthermore, insufficient training of employees expected to use the systems fuels the mixed feelings, as a result, the systems are not well embraced and this contributes negatively to employee and system performance (Al-Mamary *et al*., 2015).

Nasser, Salleh, and Gelaidan (2012) revealed that customer satisfaction is another aspect of concern in the telecommunications industry as it contributes to the value, quality and image of the corporation, which in turn relates to performance, despite the use of IS. Santoso and Yulia (2014) highlighted that the rewards of investing in IS can either be tangible or intangible, some can easily be noticed immediately while others can only be noticed over a certain period. Tangible benefits usually influence the profit of the company, whereas intangible benefits influence the company positively but do not affect profit (Santoso & Yulia, 2014). Santoso and Yulia (2014) agreed with Thouin *et al.*, (2008) that the amount of money spent investing on IS still makes people question whether they have spent enough or too much in comparison to the resultant benefits.

Additionally, Ayuba and Aliyu (2014) argued that regardless of the many benefits, there are still numerous challenges hindering organisations from fully benefitting from IS, including lack of education and training, poor infrastructure, and poor network service quality. The following section presents a review on organisational performance.

2.3 Organisational Performance

Business performance is defined as the measure of productivity (Zehir, Yilmaz, & Velioglu, 2008). Performance can be evaluated with qualitative criteria such as job satisfaction, organisational commitment, perception of justice and quantitative criteria such as profitability, investment return ratio, and sales growth (Zehir, Muceldili, Akyuz, & Celep, 2010). In addition to financial performance, market performance is important too and entails market and sales growth. Customer satisfaction and commitment change in market share, communication with customers by advertising or sales are the commonly used criteria of market performance (Zehir *et al*., 2010).

Similarly, performance is a concept of explaining the success of an organisation by presenting how an organisation has performed over a certain period and there is a general category of financial and non-financial measures of performance, although there is no single measure that can capture all aspects of performance (Gakuo, 2011). Furthermore, by finding measures of performance, an organisation's performance can be compared across different periods and with other organisations (Gakuo, 2011). Aken, Farris, Koelling, Kleiner, and Terpenny (2010) highlighted that organisational performance is the most widely used and important criterion in evaluating organisations, although there are still several challenges researchers must overcome to measure organisational performance.

Hailu (2014) defined performance as the result of an activity, while organisational performance is the accumulated result of all the activities and processes in an organisation. Organisational performance is measured and controlled by managers because it can lead

to better asset management, improve the ability to create customer value, improve knowledge and performance as well as an organisation's reputation among others (Hailu, 2014). Equally, Hailu (2014) stressed that organisational performance is assessed considering past decisions that motivated the investments. Operations and financing are measured to determine the effective use of resources. In addition, performance is assessed to determine whether the business has met or even exceeded its profit expectations, and whether financing choices were made rationally. The most commonly used measures of organisational performance include efficiency, effectiveness and industry ranking (Hailu, 2014). The following section presents the IMBOK framework.

2.4 Information Management Body of Knowledge (IMBOK) Framework

The Information Management Body of Knowledge (IMBOK) framework identifies five domains of management: information technology, information system, business process, business benefits, and business strategy (Bytheway, 2011). These domains have four two-way interfaces between them (see Figure 2.1). Management is faced with difficulties in preserving the quality and details of thinking between the five domains, and that there is not just one point of alignment but four. If information system (IS) projects do not support business processes, if business processes do not deliver the performance improvements that are expected, and if those improvements are not what strategy demanded, then all will be in vain (Bytheway, 2011). Therefore, the interfaces between the five domains is very important.

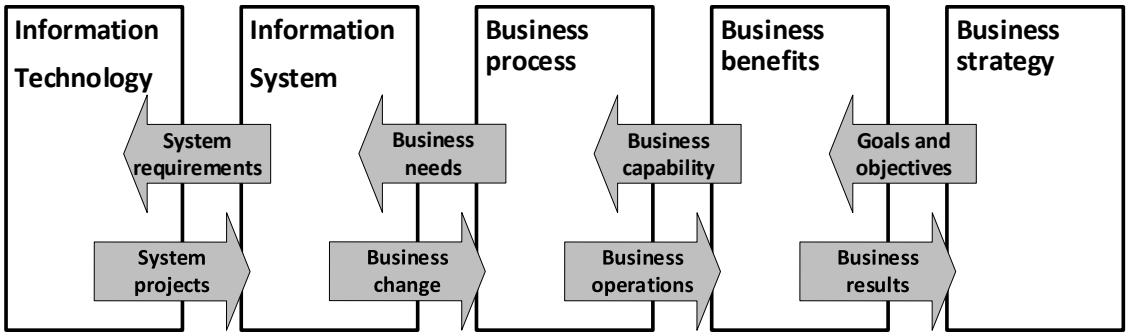

Figure 2.1: The Information Management Body of Knowledge Framework.

Source: Bytheway (2011)

The IMBOK framework is useful as it allows the assessment and analysis of the competencies required to manage the successful delivery of benefits from information technology investments (Bytheway, 2011). Although, it is difficult to determine the direct impact of information technology on organisational performance, the framework suggests that information technology enables the use of IS to support the business processes to realise the business benefits such as performance improvement that are in line with the business strategies (Bytheway, 2011). Therefore, it is clear from the IMBOK framework that the technology (IT) cannot impact performance, unless it is engineered into IS or other applications (Bytheway, 2014). Bytheway (2014) refers to an IS as the totality of technological and human components that work together to produce the information services that are needed for organisational purposes. Furthermore, Information Systems are applied to business processes to improve them and bring data to the business that becomes useful as business information (Bytheway, 2014). Hence, the impact is based on the business benefits achieved because of IT-enabled IS that is applied to business processes as per the business strategy. According to Hamilton and Chervany (1981), for

an information system to contribute to attaining organisational goals and make an impact, the IS must be effective. The following section provides a brief description of the research construct of IS effectiveness.

2.5 The construct of Organisational Performance

According to Argyropoulou (2013) in organisational research, when dealing with the broader domain of organisational effectiveness or the narrow term of performance, it is ultimately the dependent variable. The constructs may be unidimensional or multidimensional, the two models are presented to clarify these possible representations of organisational performance, see Figure 2.2 (Santos & Brito, 2012).

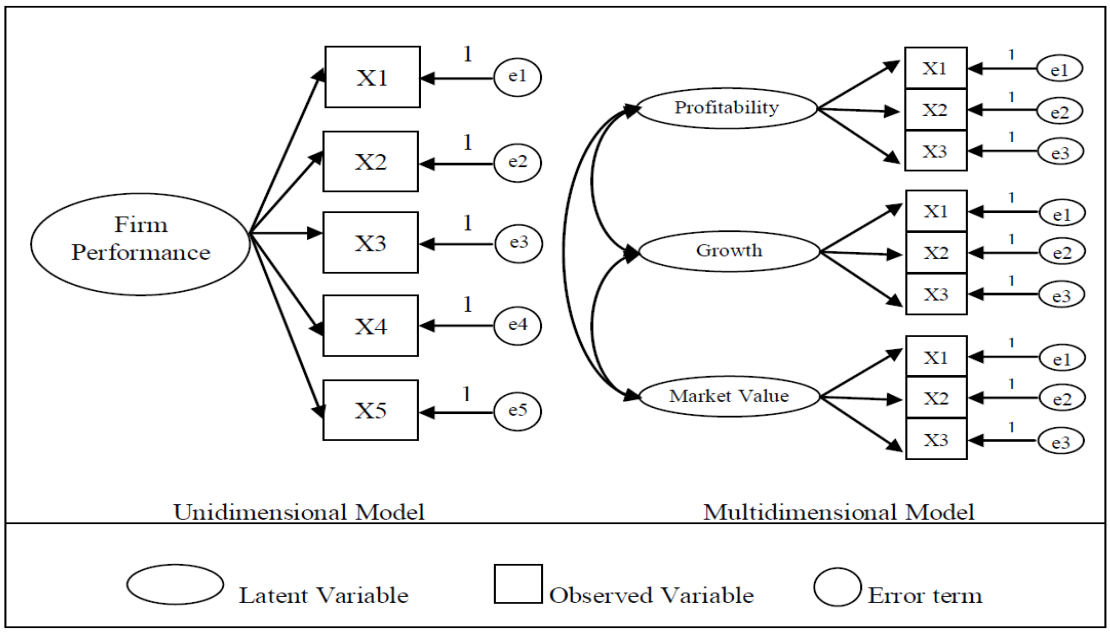

Figure 2.2: Unidimensional and Multidimensional Representation.

Source: Santos and Brito (2012)

Even when exploring organisational performance, one cannot think unidimensional theoretical construct but of a multidimensional construct (Argyropoulou,

2013). According to Argyropoulou (2013), the multidimensional theoretical construct dimensions are the stakeholders, heterogeneity, and the timeframe. Stakeholder refers to an individual or group who may affect or is affected by the accomplishment of the organisation's objectives (Santos & Brito, 2012). The Stakeholders dimension, suggests that all stakeholders have a stake derived from the activities of the organisation (Argyropoulou, 2013). Furthermore, each stakeholder utilises different measures to evaluate performance based on their personal claims to organisational value, which influence the acceptability of the measures (Argyropoulou, 2013). To measure performance under this conceptualization entails identifying the stakeholders and defining the performance results that measure their satisfaction (Santos & Brito, 2012). Employees and shareholders are stakeholders that should always be present in any analysis. Customers and suppliers are other primary stakeholders as they have a direct exchange relationship with the organisation (Santos & Brito, 2012). Furthermore, there are secondary stakeholders such as government, communities, trade associations, and political groups that do not have direct relationships with the organisation but are affected by its actions especially in terms of social or environmental consequences (Santos & Brito, 2012). It is argued that each stakeholder has its own agenda in relation to the organisation and values per set of goals, therefore, pleasing all parties equally may be an unachievable task, and managers need to prioritize (Santos & Brito, 2012).

Heterogeneity considers the fact that organisations differs in many ways, thus, the way they measure performance differs too. One key factor of heterogeneity is the industry and environment in which an organisation operates, and this factor is important as frames strategies and performance indicators (Argyropoulou, 2013). Another key factor of

heterogeneity is size, for instance smaller organisations may focus on non-financial performance measures, while larger organisations may use both financial and nonfinancial measures (Argyropoulou, 2013). Similarly, organisations that differ in size are likely to arrange their resources differently.

According to Argyropoulou (2013) organisational effectiveness can be captured by what is effectiveness, its indicators, its predictors, whether it is specified or measured, is it a constant or an idea, and why is one effective at one time and not at another. Cameron (1986) suggested that researchers should be clear about what they measure or not in terms of effectiveness, and he proposed seven guidelines, which can help to limit the scope of the assessment and provide boundaries to the definition. These guidelines included whose perspective is effectiveness judged, the domains of activity were judgement is focused, the level of analysis used, the purpose of the assessment, period employed, type of data, the referent against which effectiveness is judged. The next section details how to measure organisational performance.

2.5.1 Measuring Organisational Performance

Cook, Vansant, Stewart, and Adrian (1995) defined measurement as the process of assessing performance in terms of the clear short medium and long-term objectives attained and reporting the outcomes to management (Argyropoulou, 2013). Argyropoulou (2013) defined performance measurement as a process of quantifying the effectiveness and efficiency of certain business actions, which are considered to contribute to the achievement of organisational goals. Efficiency is defined as a measure of how economically the organisation's resources are used to provide a given level of customer

satisfaction, while effectiveness is the extent to which customer requirements are met (Argyropoulou, 2013). In addition, the process of assessing performance is based on defined goal, which means that performance measurement is not only a means of observing past data but also as a tool for gearing an organisation into a better future (Chan, Chan, & Qi, 2006).

Argyropoulou (2013) states that performance measurement is conducted through diverse performance measures and constitutes the enabler for organisations to plan and monitor the implementation of their plans to determine whether any remedial actions are required. Therefore, with performance measurement, organisations can recognise problems in their processes, in their action plans, in their strategy, and can apply corrective actions (Argyropoulou, 2013). Likewise, performance measurement can clarify how the organisation works and subsequently improves decision making at the operational and top management levels. Lastly, performance measurement can be used to motivate employees, increase accountability and reward certain behaviours and results (Argyropoulou, 2013). The next section discusses the objective measures of organisational performance.

2.5.2 Objective measures of Organisational Performance

According to Argyropoulou (2013), the most common objective measures used to measure organisational performance are financial, with indicators including earnings before interest and taxes (EBIT), profit margin, return on assets (ROA), and net operating profits. (Argyropoulou, 2013). Financial measures are utilised as tools that measure organisational performance because they include some intangible assets and are more

concerned with stakeholders, refer to Table 2.1 for indicators of financial measures (Argyropoulou, 2013). Furthermore, these measures are based on the economic state of an organisation and combine traditional measures such as costs, profits, financial margins, revenues, cash flow return on investment (CFROI), and economic value added (EVA), and cash flow (Argyropoulou, 2013).

Table 2.1: Indicative Financial measures

Beta coefficient the b-coefficient from the capital asset pricing model (CAPM)	The level of systematic risk associated with the individual firm relative to the market portfolio
Earnings-per-share (EPS)	It is equal to net operating profit minus dividends paid to preference shares divided by the number of common stocks issued.
Price-to-earnings ratio (P/E ratio)	Price-to-earnings ratio (P/E ratio)
Total shareholder return (TSR)	TSR is the sum of the change in stock price during the year and any dividends paid outs, expressed as a percentage of the opening value of the stock performance.

***Source**: Richard et al., 2009*

Financial measures are frequently used because they are easy to find, understand and calculate (Richardson, Simmering, & Sturman, 2009; Pokorna & Castek, 2012). Furthermore, they are usually available especially in state-owned enterprises because organisations are required to publish financial data by government; they are also reliable as they are subject to internal and external controls (Pokorna & Castek, 2012).

Despite the several strengths, there are limitations of using financial measures in management research; firstly, these measures cannot provide specific information related to operations and other different business units (Argyropoulou, 2013). Secondly, financial measures use historical data and may not be reliable at projecting expected future results (Richardson et al., 2009; Pokorna & Castek, 2012). Thirdly, they do not provide information on whether or not an organisation is increasing its long-term value, as they only provide a measure of short-term performance (Pokorna & Castek, 2012). Fourthly, financial measures can be distorted by factors such as government policy and variation in the rules on the accounting systems (Richard et al., 2009). Lastly, these measures exclude the opportunity cost of the equity capital invested by shareholders (Pokorna & Castek, 2012). Similarly, objective performance measures are considered confidential and are protected from public enquiry, especially in small and private organisations (Gruber, Heinemann, Brettel & Hungeling, 2010). Considering the above limitations, scholars are advised to develop subject measures as they provide more complete information (Zulkiffli, 2014). The next section discusses the use of financial and non-financial performance measures.

2.5.3 Financial and Non-financial performance measures

Throughout the 19th century and most of the first half of the 20th century the economy depended primarily on tangible assets and the financial performance measures became popular during this era (Argyropoulou, 2013). Hence, financial measures could evaluate the company and the investments it had made. However, in the second half of the 20th century intangible assets were introduced and became the dominating source of

competitive advantage in the business world. Thus, the rise in intangible asset value representation led to a reduction in market value representation of tangible assets (Argyropoulou, 2013). As a result, businesses were forced to use non-financial performance measures to quantify the organisational performance related to: customers, employees, quality, innovation, and culture (Argyropoulou, Sharma, Lazarides, Koufopoulos & Ioannou, 2010). These measures are categorised into easily quantifiable hard measures such as customer acquisition, number of complaints etc. and soft measures that are difficult to quantify such as customer satisfaction (Argyropoulou, 2013). Nonetheless, previous researchers have concluded that non-financial performance measures present a series of difficulties. Furthermore, Argyropoulou (2013) highlighted that appreciating the value of both financial and non-financial performance, many authors supported financial performance needs to be complemented by non-financial performance so that valuable conclusions can be drawn for the company and the employees. The next section details the subjective measures of organisational performance.

2.5.4 Subjective measures of Organisational Performance

Subjective measures assess the opinion about organisational performance (Richard et al., 2009). Several studies have stressed a few subjective indicators that can be used to measure performance, including customer satisfaction, company image, and job interest of employees (Shaukat & Zafarullah, 2009). A study by Gakuo (2011) on the impact of information technology investment on performance in Nairobi used the following indicators: performance of employees, motivation of employees, production capacity, and increase in revenue, variety of product and services, and the establishment of new business

centres. Furthermore, reduction in billing cycle, reduction in operational costs, less complaint from the customers, better customer care and flexibility to customer demands are other performance indicators used in organisations (Gakuo, 2011).

According to Zulkiffli (2014), various studies depend on subjective measures that are assessed by respondents. Furthermore, researchers have deliberated on the need to use subjective performance measures instead of objective measures. As cited by Zulkiffli (2014), Table 2.2 highlights the differences between subjective and objective measures based on three characteristics: indicators, measurement standard and scale anchors.

Table 2.2: Difference between Subjective and Objective measures of business performance

Differentiation Aspect	Subjective Measures	Objective Measures
1. Indicators	• Focus on overall performance	• Focus on actual financial indicators
2. Measurement standard	• Key informants are asked to rate performance relative to their competitors (and/or industry)	key informants report absolute financial data (for example, AUD profit per employee)
3. Scale anchors	• Scales range from "very poor" to "very good" to "much lower" to "much higher", or "worst in industry" to "best in industry" etc.	• Scales are not used

*Source**: Adapted from** Dawes (1999), Wall et al. (2004) and Kim (2006)*

It is difficult for businesses to reveal their actual financial performance to the public, these data are either not available, or they are hidden or tempered with by managers to protect their business' reputations or evade taxes amongst others (Zulkiffli, 2014). The relative difficulty, especially in small businesses, of collecting objective financial data has necessitated the use of subjective measurements for organisational performance (Zulkiffli, 2014). According to Zulkiffli (2014), the assessment of performance through subjective measures is essential to achieve flexibility and consistency of performance, because objective measures may differ based on industry and may obscure the relationship between independent variables and organisational performance as a dependent variable. The next section reviews some of the most important frameworks found in the organisational performance literature.

2.5.4.1 Performance measurement (Model) Framework

Argyropoulou (2013) revealed that the main performance measurement models can be divided into five typologies: internal and external models, value chain, strictly hierarchical or vertical, frustum model, and balanced models. Internal and external models measure internal performance by measuring aspects such as processes, while, external performance refers to performance as seen by customers and shareholders (Argyropoulou, 2013). Value chain measures focus on the internal relationship of suppliers and customers, whereas, strictly hierarchical (or vertical) models explore cost and non-cost performance measures for various levels of aggregation, until they ultimately become economic-financial (Argyropoulou, 2013). Lastly, frustum models change low-level measures into more aggregated indicators (Argyropoulou, 2013).

Prior research have proposed various performance measurement frameworks and are widely used (Argyropoulou, 2013). McNair, Kynch, and Cross (1990) for instance, presented the performance pyramid, also known as the strategic measurement and reporting technique (SMART), the performance measurement matrix (Keegan, Eiler, & Joemes, 1989). Similarly, Brown (1996) proposed the macro process model, while, the European Foundation of Quality Management (1993) presented the business excellence model. Furthermore, Lebas (1994) presented the 'Tableau de bord', whereas, Neely and Adams (2001) proposed the performance prism.

In addition to the abovementioned models, other scholars have presented more specific measurement models and developed approaches, procedures and guidelines for developing and designing effective performance measurement system (Argyropoulou, 2013). However, the Balanced Scorecard (BSC) framework is the widely accepted and frequently cited framework in literature. This is because the BSC framework involves the collaborative development of the business strategy and identifies the linkage between creative capacity, efficient product development processes, improved customer and stakeholder value, and financial outcomes. Furthermore, the BSC framework was awarded a prize in 1997 by the American Accounting Association and has been adopted worldwide (Argyropoulou, 2013). The framework is discussed in detail as it has been partly adopted for the operationalisation of organisational performance construct in this thesis.

2.5.4.2 Balanced Score Card (BSC) Framework

According to Bytheway (2014) the Balanced Scorecard (BSC) framework was introduced by Kaplan and Norton (1996) as a performance measurement framework that

maps an organisation's strategic objectives into four performance perspectives, namely: internal processes, learning and growth, customers and financial perspectives (see Figure 2.3). Furthermore, since the introduction and popularisation of the BSC, there has been an increased interest in business performance (Bytheway, 2014). According to Kaplan and Norton (1996) the BSC provides managers with the tool they require to navigate to future competitive success (Argyropoulou, 2013). Furthermore, the BSC provides two basic enhancement and improvements compared with the traditional frameworks.

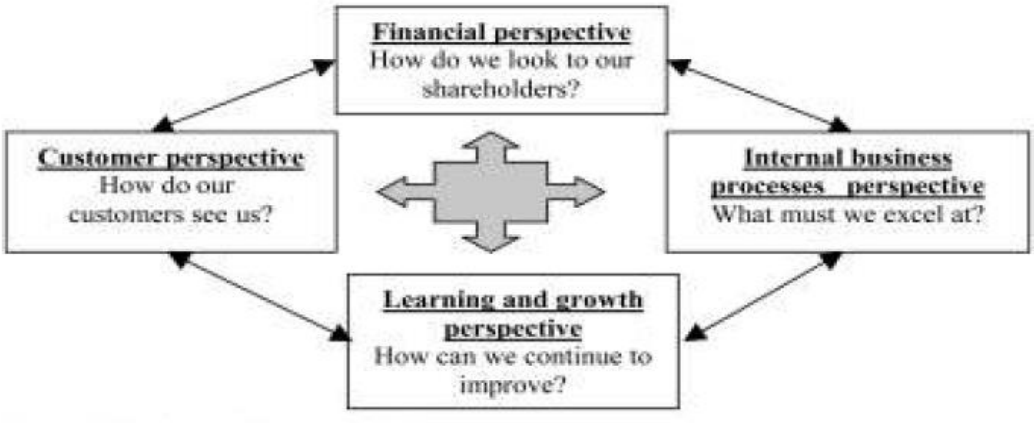

Figure 2.3: The Balanced Scorecard Framework.

Source: *Kaplan and Norton (1996)*

According to Kaplan and Norton (2004a) the financial perspective appeals mostly to shareholders and it deals with the long-term financial objectives for growth, productivity, and the outcomes of the strategy in traditional financial terms such as economic value added (EVA) and profit margin (Argyropoulou, 2013). The customer perspective defines the value proposition that can be applied for the satisfaction of customers and represents how intangible asset value is created (Kaplan & Norton, 2004a). Hence, the measure of value is derived for the customer in terms of time, quality, cost as well as the resulting outcomes such as customer satisfaction, retention, and market share

(Kaplan & Norton, 1992). The internal business process perspective focuses on the processes required to provide the value expected by the customers and the necessary measures (Kaplan & Norton, 2004b). Lastly, the learning and growth perspective emphasise on intangible assets, internal skills, and capabilities needed to support the internal processes. In other words, it refers to training, skills, and cultural attitudes of the employees as well as the appropriate measures for employees' retention, and training efficiency among others (Argyropoulou, 2013). Moreover, each of the four perspectives must be in line with the business strategy of the entire organisation.

The BSC model has many supporters because the concept is easy to understand and use, as well as its outstanding benefits, such as the enhancement of decision making and fostering of better performance. This is achieved through the linkage of financial and non-financial measures into a single document. By aligning the set targets with the business strategy, the BSC provides better performance management. Studies revealed that the measures within a BSC are sturdily interrelated; learning has direct and indirect impacts on processes and customer outcomes, which in turn leads to financial performance.

Despite the many supporters of the BSC, other researchers and academics have identified drawbacks related to the employment of this framework (Argyropoulou et al., 2010). Firstly, the limitation in performance measures may not provide a complete representation of all stakeholder's needs (Argyropoulou, 2013). Secondly, the framework disregards some measures such as partners, suppliers, and competitors. Thirdly, the chosen measures need to be aligned with the company strategy all the time: thus, it is necessary to validate the measures used frequently. Fourthly, it will be hard to assess

overall performance based on several criteria except when all measures improve concurrently, which is hardly the case. Therefore, it is difficult to decide where to trade off on numerous business operations to improve performance (Argyropoulou et al., 2010). Furthermore, many researchers recommend the use of further perspectives to include more information on human resources, stakeholders, and the environment in which the business operates. The following section discusses the impact of IS on organisational performance in terms of the BSC dimensions.

2.6 The impact of IS on Organisational Performance

Information system is very crucial to store and process data in an organisation because an organisation cannot survive without information (Kehinde & Yusuf, 2012). Furthermore, Kehinde and Yusuf (2012) agree that the right information provided at the right time empowers businesses make more accurate decisions, plan and control the business activities. IS creates an impact on the business functions, performance, and productivity (Hailu, 2014). The use of computers and IS has brought many changes to businesses that are felt in various areas including decisions making by managers (Hailu, 2014). Furthermore, IS can change the way decisions are made and has finally allowed managers time to get out of the office more. Information systems enables staff to perform their duties more effectively with greater efficiency, high quality, improved retrieval of information, paper works elimination, and instant sharing of information (Hailu, 2014). On the contrary, Hailu (2014) stresses that despite the positive impact IS has its negative impacts as well, including the displacement of workers, privacy violation, and information anxiety.

According to Kehinde and Yusuf (2012), information system is very crucial in an organisation and its importance cannot be over emphasized as no organisation can survive without information. Caranana (2012) pointed out that the right amount of information at the right time is a key factor for every organisation, because information enables organisation to make decisions that are more accurate. Furthermore, managers take decisions, prepare plans and control their organisation's activities using information (Caranana, 2012). Equally, an IS plays a very significant role within an organisation by creating an impact on the organisation's functions, performance and productivity (Hailu, 2014). Hailu (2014) emphasizes that the impact of IS on the organisational functions is in its management and with a good support, the management of finance, marketing, production and personnel become more efficient. Turban (2010) emphasized that the use of computers and information system has brought many changes to organisations, which are felt in different areas including the manager's job, structure, authority, power, and job content; employee career ladders and supervision.

2.6.1 Research Model and Conceptualisation

The research theoretical framework depicted in Figure 2.4 for organisational performance construct is based on Kaplan and Norton (2004a) Balanced Scorecard (BSC) framework and was presented previously in chapter one. Pertinent literature revealed that it is difficult to measure organisational performance from a single dimension and most researchers used the sub-constructs of customer, learning and growth, financial and internal business processes (Kaplan & Norton, 2004). The BSC choice was based on its

benefits as it represents the four perspectives. Furthermore, the research reinforces the use of non-financial subjective measures to assess organisational performance. To ensure validity of the scales used, the characteristics used for the constructs were borrowed from previous studies. The research used some of the items listed in Table 2.3, representing the four BSC perspectives and some net benefits from the DeLong and McLean model (2002) as measures of organisational performance. The remainder of the chapter details the conceptualisation of organisational performance based on the BSC dimensions and the formation of the research propositions and hypotheses.

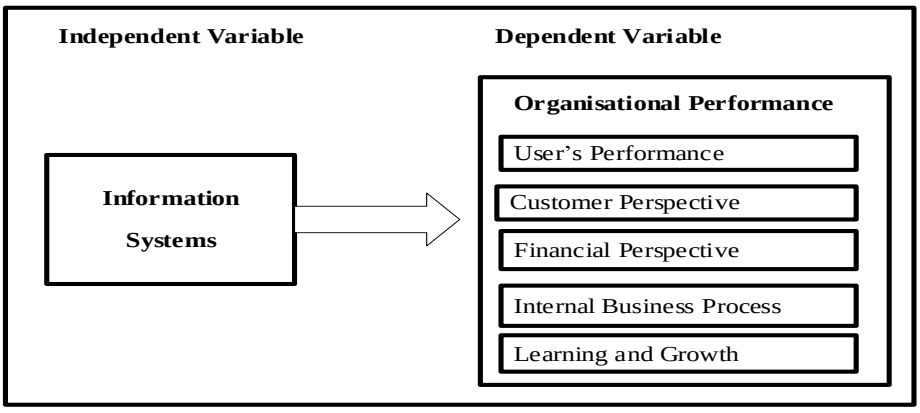

Figure 2.4: The Research Framework

Source: *Researcher's Construct*

Table 2.3: Conceptualisation of Organisational Performance

Organisational Performance measures	
Financial Perspective	**Customer Perspective**
Company's productivity	Delivery of goods that meet customer needs
Company's income	Delivery of services that meet customer needs
Company's production cost	Delivery of goods according to specifications
Company's inventory levels	Customer complaints
Company's logistics costs	Customer satisfaction

Company's gross profit	Replenishment time
Learning & growth Perspective	**Internal Business Processes Perspective**
Supplier's defect free deliveries	Timely decision making
Replenishment time	Organisational flexibility
New product / services development	Information flow between departments
Range of products and services	Cooperation between departments
Innovation capacity	Achievement of strategic goals
Forecasting capability	Increase of market share
Information sharing through the Supply Chain	Competitive position

*Source**: Adapted from** Argyropoulou (2013)*

2.6.1.1 The impact of IS on User Performance

According to Ali and Younes (2013), it is crucial to understand the impact of IS on the performance of users, as it can improve performance either individual or organisational. IS help users do their job more effectively, aids users with decision-making, helps with planning, follow up and control of activities (Babu & Sekhar, 2012). Using relevant, timely, and accurate facts supplied by IS helps users do their job better by identifying problems, opportunities and solutions (Hailu, 2014). IS aids users do their jobs with greater efficiency, higher quality product and services, better information retrieval, eliminate paper works, and instant share of information. On the other hand, IS can have a negative impact on users including eliminating jobs, violating privacy, creating information anxiety, frustration, stress and even injuries. (Hailu, 2014). Thus, considering the above the research proposes that:

- $\mathbf{H_{1.0}}$: Information Systems do not have a positive impact on user performance.
- $\mathbf{H_{1.1}}$: Information Systems have a positive impact on user performance.

2.6.1.2 The impact of IS on Customers

Vandyck (2016) highlights that using technology and information system set expectations of customers high. In addition, what better feeling is there than for a customer to have his/her expectations exceeded. In fact, there is no business that is immune to unhappy customers, that is why even businesses with the best customer services in the world still lose their customers to rivals, hence the importance of maintaining customer satisfaction (Vandyck, 2016). Using self-service support portals, IS provides an interactive platform for customers to share their concerns and have their needs attended to in a timely manner (Vandyck, 2016).

In the same vein, IS enables the business to follow up with customers after a business transaction which proves to customer that the business wishes to hear from them. In addition, by soliciting feedback the information obtained can be used to make informed decisions to find innovative ways to ensure that business remain relevant to customers and hopefully open profitable opportunities (Vandyck, 2016). Information systems significantly builds customer loyalty as it strives to empower and educate customers (Vandyck, 2016). Roy (2011) supported that IS has positive impact on customer satisfaction, which in turn has a positive and significant impact on customer loyalty. Therefore, to improve customer satisfaction, businesses make greater use of IS in their internal business processes (Roy, 2011). Similarly, Vandyck (2016) assert that IS influences customer satisfaction which is directly related to trust, and if the service is reliable, customers believe in the services and purchase continually.

Wilson, Iravo, Tirimba and Ombui (2015) stated that, in business management, IS aid the functions of leading, planning, organizing, monitoring and controlling of all factors and tasks in an organisation to accomplish business goals and objectives. Likewise, IS foster advancement in business process performance, which is crucial for business management. Rapid changes in customer demand, globalization of markets, and ever-changing technology necessitate organisations to focus their efforts on improving competitiveness, trying to achieve customer's satisfaction through added value to their products and services (Wilson, *et al*., 2015).

In addition, through innovation, information system is perceived as part of business management, allowing new processes, products, and services to be implemented in prompt response to customer requirements (Sullivan, 2005). Closs and Kefeng (2007) emphasise that, the goal of an organisation is to provide customers with the best services in an effective and efficient manner. Therefore, to achieve this, IS provide organisations with useful information such as product description, product availability, shipping dates, order status, and support organisations with any related information processing need. Equally, Wilson, *et al*., (2015) highlighted that through demand forecasting, order processing, service levels, service/part support and operations are some functions that defined customer service and are supported by information systems. Based on the above, the research proposes the following hypotheses:

- $\mathbf{H_{2.0}}$: Information System do not have a positive impact on customer satisfaction.
- $\mathbf{H_{2.1}}$: Information Systems have a positive impact on customer satisfaction.

2.6.1.3 The impact of IS on Financial Performance

According to Wu, Huang, and Liu (2014) businesses with superior IT capabilities are better at leveraging information technologies to improve operational efficiency, reduce costs, improve management and decision-making, and make full use of the changes in consumer preferences. Businesses with superior IT capabilities tend to outperform others in terms of profit and cost-based performance measures (Wu *et al*., 2014). Businesses should pay more attention to the strategic use of IS as it improves operational efficiency, reduced operating costs and transaction costs (Wu *et al*., 2014). Hence, businesses with superior IS capabilities improve business process efficiency, reduce product / service costs through accumulated investment and deployment of IT. Furthermore, IS capability can aid a company reduce costs as well as increase sales. IS create information efficiency, improve analytical skills and provide market sensitivity, which in turn enables then to quickly find an abnormal market, and respond effectively to this change before competitors (Wu *et al*., 2014). Businesses are using internet technologies to expand online sales channels, thus realizing collaborative advantage between online and offline sales channels and opening global market (Wu *et al*., 2014).

By using IS, the scope for action is expanded, thus providing time savings in trips to and dealings with banks, the administration and this reduces company's costs (Kilonzo, 2012). Productivity increases when these innovations are properly used. One of the major benefits of computer based financial information systems is that they automate and streamline reporting (Kilonzo, 2012). Financial management information systems (FMIS) eliminate and transfer the manual accounting transactions to an integrated and automated system across the organisation (Kilonzo, 2012). Through automation, IS improves

accounting processing efficiency leading to improved service delivery and high productivity, thus fostering accurate and timely financial management reports (Kilonzo, 2012). Sambasivam and Assefa (2013) revealed that accounting information systems AIS improves the quality of financial reports and financial transaction processes leading to better decision making by managers and efficient internal control systems. Likewise, Ahmad and Alrjoub (2014) found that AIS has a significant impact on administrative decisions taken by managers and suggested a need for continuous improvement in AIS because of its positive role in the decision-making and investment. Neogy (2014) revealed that by utilising IS, internal control system exists through safeguarding of assets, reliability and accuracy of information and fraud prevention increases efficiency. Information systems can be used as a controlling mechanism such as budgeting (Kilonzo, 2012).

On the other hand, Kilonzo (2012) highlights that financial IS investment has the potential of providing competitive advantage, however actual returns on such investment differ and past investments are ranked disappointing. Similarly, Al-Shaefee (2007) revealed that most companies failed to adopt modern AIS due to insufficient training courses provided to employees. In turn, Al-Shaefee (2007) recommended continuous training of accountants in organisations to make them more familiar with advanced Accounting Information Systems (AIS). This is supported by Samuel (2013) who found that there exists a relationship between AIS and organisational performance, but highlighted challenges faced by organisations such as lack of proper training, high staff turnover, and lack of proper system documentation. Considering the above, this research suggests that:

- $\mathbf{H_{3.0}}$: Information Systems do not have a positive impact on financial performance.
- $\mathbf{H_{3.1}}$: Information Systems have a positive impact on financial performance.

2.6.1.4 The impact of IS on Growth and Learning

Presently, the applications of information technology including the use of IS can either enable or disable growth and learning in an organisation (Hailu, 2014). On the enabling side, IS are designed to enhance organisational memory and to facilitate communication and discourse among members of the organisation (Hailu, 2014). These functions can be performed without IS but IS allow these functions to be performed more effectively. Equally, IS has greater potential to support organisational learning through the capture, representation, storage and retrieval of structured data, diagrams, models, text, and images in electronic databases (Hailu, 2014). Additionally, IS can support the organisational memory more effectively compared to systems that are not specifically designed for that purpose (Hailu, 2014).

According to Quresh and Uppatumwichian (2008) IS utilization, at one hand, supports the learning process and increases the organisational learning capacity, whereas on the other hand organisational learning facilitates the adoption of new technological changes (new IT and IS) in the organisation. Quresh and Uppatumwichian (2008) stressed that IS enables employees to share knowledge across the organisation. Furthermore, staff members are assigned login credentials to access the company's intranet where all the knowledge management tools are. IS allows the use of a customized online learning portal,

whereby, every staff member is periodically reminded and updated about the upcoming mandatory and voluntarily training sessions corresponding to his/her own need (Quresh & Uppatumwichian, 2008). In addition, IS can offer an online employee scheduling management tool, that is only accessed by authorized Human Resources (HR) personnel that is tasked with the role of planning and allocating staff, the project lead, employee him/herself, and the employee's career counselor. The scheduling tool is important as it help staffs in terms of training needs and work experience in any specific area to gain both the broad knowledge and expertise in specific area (Quresh & Uppatumwichian, 2008).

Information Systems enable the use of knowledge exchange database, a repository database comprised of past knowledge and expertise of all projects conducted by the organisation (Quresh & Uppatumwichian, 2008). It is one of the major internet-based information technologies that stores all the explicit information including proposals, credentials, references, external contents, discussion forums. Discussion forum is the place providing an opportunity to capture personal knowledge and distribute it. Employees can discuss the ideas, share information and ask any specific information from other employees regarding their needs related to the projects on this forum. In the case, that information cannot be documented, a list of reference persons on the project is provided for further consultation and contact.

Similarly, IS foster the people directory, an online database containing contact information of each individual employee that worked for the organisation (Quresh & Uppatumwichian, 2008). This database eases the process of getting into contact with the persons who possess the right expertise required. Equally, the use of electronic mails

facilitates faster and efficient communication. Nevertheless, other studies have revealed that IS and other applications of technology may unintentionally disable organisational learning by inducing dependency on inflexible, formal systems (Hailu, 2014). Therefore, considering the above the research proposes that:

- $\mathbf{H_{4.0}}$: Information Systems do not have a positive impact on learning and growth.
- $\mathbf{H_{4.1}}$: Information Systems have positive impact on learning and growth.

2.6.1.5 The impact of IS on Internal Business Processes

According to Wu, Huang, and Liu (2014) IS influence the business processes rather than the products. This was supported by Gu and Jung (2013) who indicated that IS capabilities not only have direct impact on business process performance but also have an indirect impact on business process performance by enhancing IS usefulness and qualities. As a result, business process performance positively influences organisational performance. By introducing user-friendly solutions, through automation, managers can monitor their company resource virtually everywhere in the world using their personal computer, laptop, tablets, or smart phone (Vandyck, 2016). Similarly, companies with better IS development are effective at enhancing customer relationships and customer services (Kim, Tao, Shin, & Kim, 2010). Through IS business processes are more flexible and convenient (Kim *et al*., 2010).

Information systems have eliminated the manual processing of customer transactions and has proven to be more efficient in the various stages of processing and

payment (Vandyck, 2016). In turn, IS makes business processes quite faster, preventing unnecessary delays in service delivery. Presently, customers can call the Contact Center on their grievances in the convenience of their own home (Vandyck, 2016). Again, by making use of IS, customers and employees can receive their monthly statements electronically and pay their contributions online without stepping foot at the organisation, hence, making the manual way of doing business a thing of the past.

Kanuna (2011) emphasizes that IS have made it possible for services which used to be delivered in person to be delivered remotely over the network. Furthermore, IS ensures that information is instantly available, and information can be reusable, for instance information captured for one purpose and can be used for others (Kanuna, 2011). IS such as electronic mail and groupware help improve information flow among employees within an organisation, as well as their customers and suppliers (Rastrick & Corner, 2010). IS enables more flexible and networked structures, dispersed team and teams that come and go as the need changes.

Similarly, IS supports unstructured management processes and highly re-utilised business processes (Rastrick & Corner, 2010). Equally, IS provides more effective ways of accessing information from multiple sources, as well as use of external information on databases and the internet (Kanuna, 2011). Decision support systems that operate in a meeting room environment can help improve decision-making. Being effective requires knowing how best to use the power of IS for accessing information, communicating ideas and results, connecting to experts, and packaging the knowledge for reuse. IT and IS diminish the effect of distance means that it creates a variety of options for reorganizing

the workplace. IS offers more flexibility in workplaces, allowing desk sharing and a degree of location independence within a building. Likewise, it permits the distribution of work teams, hence saving costs of travel and relocation. Furthermore, it creates the mobile professional allowing personnel to work effectively from home (Kanuna, 2011).

Babu and Sekhar (2012) asserted that IS can change the way in which many decisions are made, consequently changing manager's jobs allowing them time to get out of the office and into the field. IS have helped millions of people carry out their duties more effectively, and every person in the organisation needs or generates information, therefore, no individual can totally detach from IS (Caranana, 2012). Similarly, IS help managers decide what action is most effective for the organisation, computers support in planning of future activities, help follow-up and control of activities in process (Caranana, 2012). By using facts supplied by IS that are relevant, accurate, and timely, a manager can do a better job of identifying opportunities, problems, and solutions.

Information systems aid staffs do their jobs more effectively with greater efficiency, higher quality product or services, better information retrieval, eliminate paper works, and instant share of information amongst others (Hailu, 2014). In the service industry, IS influence the decisions made by managers as well as the services and products offered to customers (Ralabandi, 2014). Kuri (2007) agreed that an organisation's IS capabilities may increase or decrease its ability to respond to market demands and encourage innovation to respond to the customer demands. Similarly, IS are likely to transform and improve business processes which consequently contributes to strategic and

operational performance (Jean, Sinkovics, & Kim, 2008). Considering the above, the research hypothesizes that:

- $\mathbf{H_{5.0}}$: Information Systems do not have positive impact on internal business processes.
- $\mathbf{H_{5.1}}$: Information Systems have a positive impact on internal business processes.

2.7 Summary of Literature Review

This section was an in-depth review of the information system and organisational performance. There is a great deal of agreement among scholars that quantifying the impact of IS on organisational performance is a very difficult process. The IMBOK framework was found appropriate to assess the impact of IS on organisational performance, as it suggests that information technology (IT) enables the use of IS to support the business processes to realise the business benefits such as performance that are in line with the business strategies. The IMBOK framework has five domains; information technology, information system, business process, business benefits, and business strategy.

Conversely, the review also focused on organisational performance, and its measures. The literature review revealed that there are many performance measurement frameworks, but the Balanced Scorecard was the most popular and widely adopted framework over the years. Although, there were other frameworks used to measure performance the BSC framework surfaced as the most appropriate model for evaluating organisational performance. The BSC four dimensions of performance measurements

were identified as customer, financial, learning and growth, and internal business processes. Each dimension has different characteristics that are used as measures of performance. Moreover, the BSC has been adopted for the operationalisation of organisational performance and the conceptualisation of the research framework, which resulted into the formulation of five (5) research propositions and hypotheses to guide the research. The next chapter discusses the methodology followed to test the propositions as well as the resultant hypotheses, towards answering the main research questions.

CHAPTER THREE

3. RESEARCH METHODS

3.1 Introduction

This chapter provides a detailed discussion of the research approach and designs, population, the sampling method, the method of data collection, analysis and research ethics considered for this research.

3.2 Research design

The research applied a mixed method, qualitative and quantitative within a case study research design. The quantitative method focuses on numerical data that can be analysed statistically. Quantitative data was generated through a questionnaire with semi-structured questions, which targeted staff that have been permanently employed at TN for at least one year as they can relate to the current and past situation. Google group online questionnaire plugin data analysis software was used, then the data was imported to SPSS software for further analysis to determine the impact of IS on organisational performance. The qualitative method offers an opportunity to explore and describe the subject as experienced by the respondents (Hailu, 2014). This suited the purpose of this research. Interviews were conducted to acquire qualitative data and targeted managers employed for over 10 years to help the researcher understand the past. For the interviews, the researcher used an interview guide with non-structured questions to allow the respondents to talk in depth and provide rich cross-sectional data. Additionally, a pilot study was

administered to a randomly selected group of five (5) individuals within the population to test the reliability and validity of the questionnaire.

In terms of philosophy, the research is based on two pillars: positivism and interpretivism. Positivity approach was adopted for quantitative method whereby the researcher developed hypotheses from a theory about the phenomenon under research. Whilst, interpretivist (phenomenological) approach was adopted for qualitative method since the research attempted to explore the perceptions and attitudes of managers, from their own unique point of view at Telecom Namibia. In an interpretivist approach, the researchers must look as the world through the eyes of those experiencing it and discover how they interpret their own experiences and make sense of the world around them (Bryman & Bell, 2011).

3.3 Population

The population targeted for this research comprised of the 400 permanent employees from the eight (8) business units at TN in Windhoek.

3.4 Sample size

The research was based on probability sampling strategy, particularly; the simple random sampling technique was used for the questionnaire sample. The sample size was calculated using a system developed and used by Creative Research Systems and MaCorr research experts using MaCorr sample size calculator. In calculating the estimated sample size, the researcher used a confidence level of 95%. The resultant questionnaire sample size was estimated at 150 employees. Generally, quantitative research samples are

relatively large so that statistical results can be generated from and for, the population from which the sample was extracted (Finn, 2013). For interviews, 12 managers mainly using IS out of 18 managers were purposively sampled. The qualitative research sample size is relatively small, but participants are selected based on their suitability as perceived by the researcher (Finn, 2013).

3.5 Research instrument

The research instruments used to collect primary data was a questionnaire with semi-structured questions and an interview guide with non-structured questions. The structured questions used a 5-point Likert type scale to facilitate quantitative analysis. The research instrument was developed based on the BSC framework covered under the literature review pertaining to the impact of information systems and organisational performance to help answer the research questions of the study. An interview guide with semi-structured questions was administered to Managers employed for over 10 years. The Managers were selected because they were senior people and could provide a rich cross-section of data. Furthermore, a pilot study was administered to five (5) randomly selected individuals within the population. The purpose of the pilot study was to ensure that the research method used was appropriate and that the research instrument gathered data essential for the study (Bryman & Bell, 2011). This aided the researcher to refine the questionnaire so that it met the research objectives and produced results comparable with past studies.

3.6 Procedure

Firstly, the researcher administered a pilot study to five (5) randomly selected telecom individuals to improve the validity of the questionnaires. Email facilities were used to distribute the questionnaires for the pilot study and were accompanied by a cover letter explaining the purpose of the survey.

Secondly, questionnaire data was administered to the 150 workers and collected online. This was because employees were spread out across the organisation and had access to the internet, and email. For ease of administration and reach, an e-mail was sent to the targeted participants with a letter attached explaining the background of the research, a request to partake in the research and advice to recipients on how to access the online questionnaire. The attached letter also informed the recipients that the survey was anonymous and no personal information was required. The participants were given two weeks to complete the survey, subsequently, email notifications were sent to remind them to complete the survey.

Thirdly, interview sessions were scheduled a week in advance using Microsoft Outlook, and were completed within two weeks. The researcher attached the interview questions to the schedule, to give the participants sufficient time to prepare for the interviews. Due to the Managers' busy schedules, out of the 12 managers only six (6) managers responded to the interview whereby only two managers were able to do face to face interviews which were recorded. Whilst, the remaining four managers kindly completed the interview questions and emailed them back to the researcher. The

researcher emailed and called the Managers to remind them of the scheduled interview sessions.

3.7 Data analysis

Data collected from the research through Google online questionnaire was processed, cleaned and imported into the statistical package for social science (SPSS) computer programme for further analysis. Descriptive statistics like frequency distributions, percentages and averages were used to analyse demographic characteristics. In addition, hypothesis-testing using one sample t-test inferential statistics was applied to determine the relationship between information systems and the five dimensions of organisational performance. Furthermore, standard deviation was computed to test for consistency and the variability of responses across the study. The significance level for every set was set at 5%. From a qualitative perspective, the researcher used content analysis to summarise and categorise the interview field notes and recorded data according to common themes.

3.8 Research ethics

Research ethics were followed throughout the duration of the study. The researcher obtained a letter from the Namibia Business School and Telecom Namibia, authorising the collection of data. In addition, an ethical clearance was sought from the University of Namibia's ethics committee. The researcher outlined to the participants what the research was about, the importance of the study and asked for their consent to partake. Participants were given information relating to the purpose of the study, benefits of the study and the

time the participants were expected to take to complete the questionnaire. Participants were informed that their participation would be voluntary, and they would remain anonymous. They were further assured of the confidentiality of their responses and identities. Thus, no names were used in the final research report. The researcher in some cases, for clarity however related to their position and duration of employment. To avoid plagiarism, the ideas borrowed from other researchers were properly acknowledged. The questionnaire data is being kept for five (5) years on a password protected google drive and will be erased thereafter. On the other hand, the interview data (recordings and notes) are being kept in a locked cabinet for a period of five (5) years and will be erased, shredded and burnt, respectively thereafter.

3.9 Summary

This chapter presented the methodology used in this study, whereby the research design, the population of the study, sampling strategy, research instruments, data collection procedures, data analysis and research ethics were discussed. The following chapter presents and discusses the descriptive analysis, correlation analysis and findings of the research.

CHAPTER FOUR

4. RESULTS AND DISCUSSION

4.1 Introduction

The previous chapter detailed the research methods employed by the researcher to collect the relevant data. This chapter presents the data analysis and discusses the overall findings of this research. The research sought to assess the impact of information systems on organisational performance at Telecom Namibia. The results presented relate to the two research questions below:

i. How do we measure the impact of Information Systems on Organisational Performance at Telecom Namibia?
ii. Is there a positive relationship between Information Systems and Organisational Performance at Telecom Namibia?

4.2 Quantitative Analysis

This research section presents the results of the questionnaire, which was presented to TN employees in the form of quantitative analysis. SPSS was used for analysis and all tests were carried out at 5% level of significance. The researcher used descriptive statistics such as graphic tables, pie charts, and bar charts to aid the analysis of data and make the results clearer. The results of the research, in relation to the research objectives, will be presented. A one-sample T-test was used to test for the relationship between IS usage and

performance by comparing the mean differences. The following sub-sections present the analysis and interpretation of data obtained from the respondents through the questionnaire.

4.2.1 Response Rate

As indicated, the data-gathering instrument used was a questionnaire, which was self-administered. According to Kariuki (2015), a response rate of 50 percent is adequate for analysis and reporting, whereas a rate of 60 percent is good and a rate of 70 percent and above is excellent. In total, 81 completed questionnaires were received from 150 distributed questionnaires resulting in a response rate of 54 percent, which was considered sufficient and representative.

4.2.2 Demographic characteristics of employees

Before a detailed analysis of data, basic distribution according to respondent's designation, business unit, the number of years they had worked at TN, the systems used by the respondents and how often they use the systems were initially performed. Below are the graphical presentations of the demographical variables.

4.2.2.1 Level of employment (Designation)

Figure 4.1 shows the distribution of respondents in relation to their designation within TN. Out of the 81 respondents 50 (62%) were subordinates, 25 (31%) middle managers, 5 (6%) senior managers, and 1 (1%) executive manager.

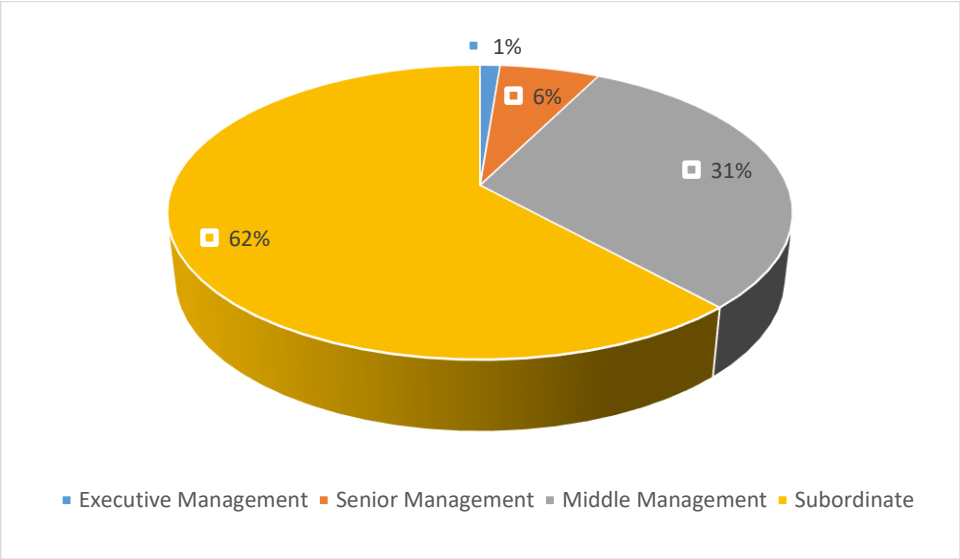

Figure 4.1: Representation of Respondents by Designation

Source: *Research Findings*

4.2.2.2 Business Unit

Table 4.1: Representation of Respondents by Business Unit

Business Unit	**Frequency**	**Percentage (%)**
Technical Operations	66	81
Human Resources and Strategic Training	2	2
Commercial	9	11
TN Mobile	3	4
Finance and Administration	1	1
Internal Audit and Risk Management	0	0
Corporate Communication and Public Relations	0	0
Legal Services and Company Secretary	0	0
Total	81	100

Source: *Research Findings*

Table 4.1 shows the distribution of respondents in relation to the Business Units they work in. Most of the respondents (81%, n =66) worked in the Technical Operations business unit, 2% (n =2) in Human Resource and Strategic Training, 11% (n = 9) in Commercial, 4% (n=3) in TN Mobile, and 1% (n =1) in Finance and Administration. Unfortunately, there were no respondents from Legal Services, Company Secretary, Corporate Communications and Public Relations, as well as Internal Audit and Risk Management business units. Technical Operations and Commercial business units outnumbered the rest of the departments due to the nature of the organisation.

4.2.2.3 Work Experience in TN

Table 4.2 shows that the majority of the respondents, (37%, n =30) had been in TN for 5 to 10 years while those who had been with TN for 11 to 15 years constituted 23% (n =19) of the total sample size. The remaining group showed that 10% (n =8) of the respondents had worked within TN for more than 20 years, 10% (n =8) had been with TN for 16 to 19 years whilst 20% (n =16) of the respondents only had less than five years' experience.

Table 4.2: Representation of Respondents by Work Experience at TN

Years of Employment	**Frequency**	**Percentage (%)**
Less than 5 Years	16	20
5 – 10 Years	30	37
11 – 15 Years	19	23
16 – 19 Years	8	10
20 Years and Above	8	10
Total	**81**	**100**

Source: *Research Findings*

4.2.2.4 Level of Information System usage at TN

Table 4.3: IS at employees' disposal

IS at used	Frequency	Percentage (%)
Electronic mail	67	82.7
Payment system (e.g. Skypos payment system)	2	2.5
Work Order Management System (WOMS)	10	12.3
Network Management System (NMS) e.g. Netcool, CACTI, ICINGA	31	38.3
Element Management system (EMS) e.g. U2000, TNMS, Alvaristar, Breezeview, TR069, Netnumen	26	32.1
SAP system	39	48.1
Call Centre system	7	8.6
Billing system (Calabash, Zsmart)	38	46.9
Internet	66	81.5
Others	26	32.1

Source: *Research Findings*

Table 4.3 shows the distribution of respondents in relation the information systems used to perform their duties. The majority of the respondents (82.7%, n =67) used email, 81.5% (n =66) internet, 48.1% (n = 39) SAP system, 46.9% (n =38)to billing system, 38.3% (n = 31) NMS, 32.1% (n = 26) EMS, 32.1% (n =26) other systems, 12.3% (n =10) WOMS, 8.6% (n = 7) Call centre system and 2.5% (n =2) Payment system (2.5%) to enable them to perform their duties at TN.

4.2.2.5 Distribution of Respondents by Frequency of IS usage

Table 4.4 shows that the majority of the respondents, (49.4%, n =40) uses an information system more than 20 times daily, while those who used IS within 5 to 10 times daily constituted 25.9% (n =21) of the total sample size. The second last group shows that 18.5% (n =15) used an IS 11 to 20 times daily whilst 6.2% (n =5) of the respondents only used an IS less than 4 times daily.

Table 4.4: Representation of Respondents by Frequency of IS usage

Frequency of IS usage	**Frequency**	**Percentage (%)**
Less than 4 times daily	5	6.2
5 – 10 times daily	21	25.9
11 – 20 times daily	15	18.5
More than 20 times daily	40	49.4
Total	81	100

Source: *Research Findings*

4.3 Impact of IS on Organisational Performance

The 5-point Likert scale (Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD)) was used to indicate the respondents' level of agreement with various statements on characteristics of organisational performance based on the BSC domains and an additional domain of user performance at TN. The BSC domains of organisational performance are financial performance, customers, internal business processes as well as learning and growth.

4.3.1 User's performance

In terms of users' performance, the following characteristics were considered: ease of performing duties, decision-making, confidence, quality of work, facilitation of learning and knowledge, as well as processing time and costs to the users. It is evident that IS does impact user's performance at TN as most (98%) of the respondents agreed (agree or strongly agree) on the various statements characterising the impact of IS on user's performance. Below are some of the graphical presentations on the findings of the impact of IS on users' performance: -

Figure 4.2 shows that most of the respondents either agreed (20%, n =16) or strongly agreed (78%, n =63) that the use of IS made it easier for them to do their job.

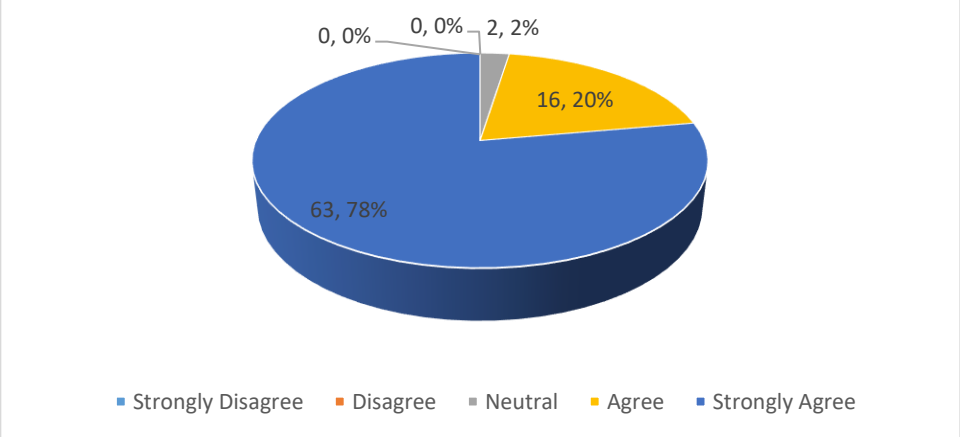

Figure 4.2: Ease of performing duties

Source: *Research Findings*

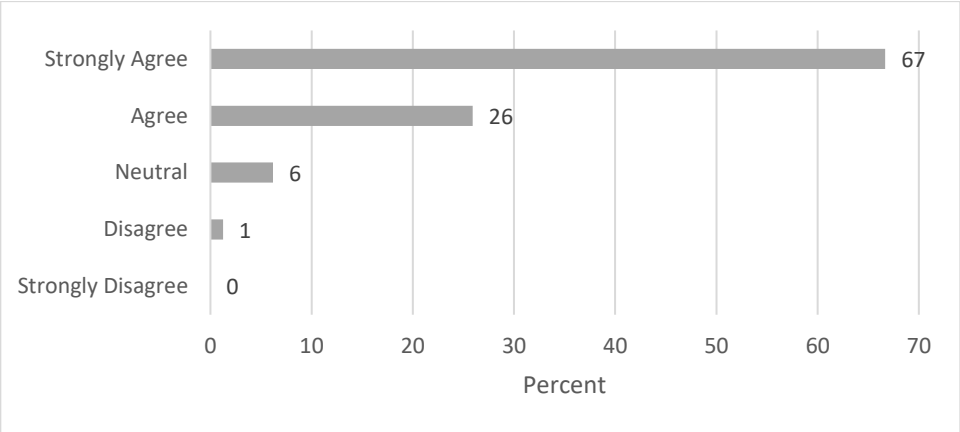

Figure 4.3: Improvement in quality of work

Source: *Research Findings*

Figure 4.3 shows that most of the respondents either agreed (21%, n =16) or strongly agreed (67%, n =54) that the use of IS has improved the quality of their work. Figure 4.4 shows that majority of the respondents either agreed (43%, n =35) or strongly agreed (36%, n =2941) that IS facilitates their learning. Although, it is worth noting that the third largest group of respondents 20% (n =16) were neutral to this statement.

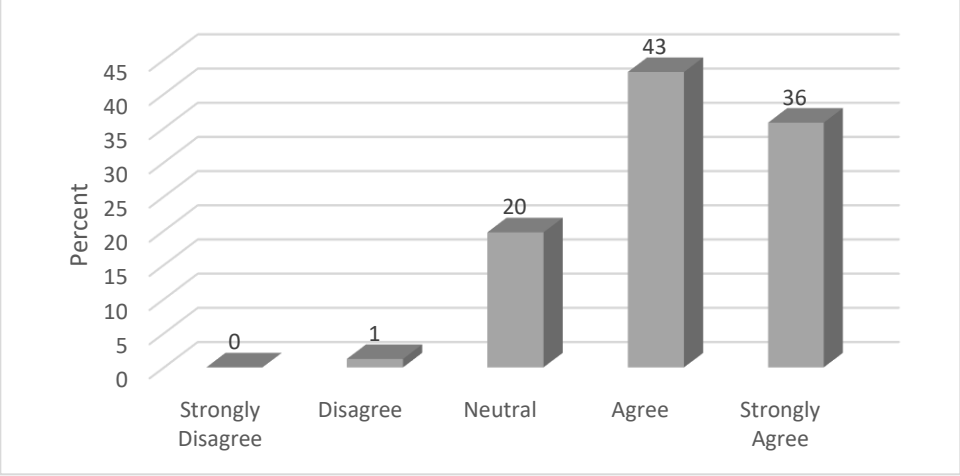

Figure 4.4: Reduction in processing costs

Source: *Research Findings*

4.3.2 Customer satisfaction

On customers, the following characteristics were considered: delivery of goods and services to meet customer needs and according to specifications, customer retention, quality of service delivery, communication, customer care, reduction in customer complaints, improving of planning and execution of projects in reaching customers. The results revealed that IS does affect TN's customers the majority of respondents agreed (agree or strongly agree) on the various statements characterising the impact of IS on customers. Below are some of the graphical presentations on the findings of the impact of IS on customers: -

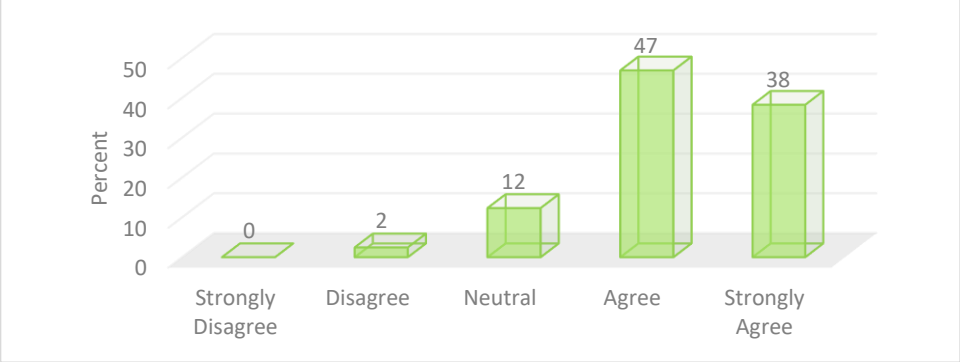

Figure 4.5: Improvement in delivery of goods & services to specifications

Source: *Research Findings*

Figure 4.5 shows that majority of the respondents either agreed (47%, n =38) or strongly agreed (38%, n =31) that IS improves the delivery of customer goods and services according to specifications. Figure 4.6 shows that majority of the respondents either agreed (43%, n =35) or strongly agreed (28%, n =23) that the use of IS has helped to retain customers. The company's subscriber records support this as shown in Table 4.5.

However, it is worth noting that the third largest group of respondents 20% (n =16) were neutral to this statement.

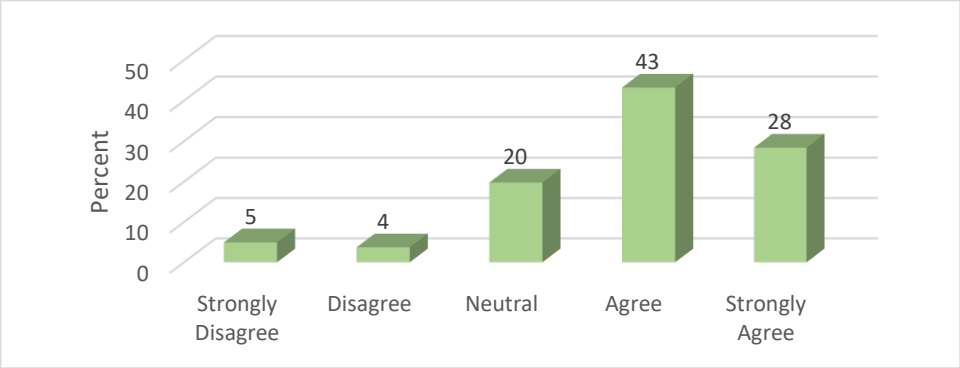

Figure 4.6: Retention of customers

Source: *Research Findings*

Figure 4.7 shows that the majority of the respondents either agreed (33%, n =27) or strongly agreed (27%, n =22) that the use of IS has helped reduce customer complaints. It is worth noting that the third largest group of respondents 32% (n =23) were neutral to this statement.

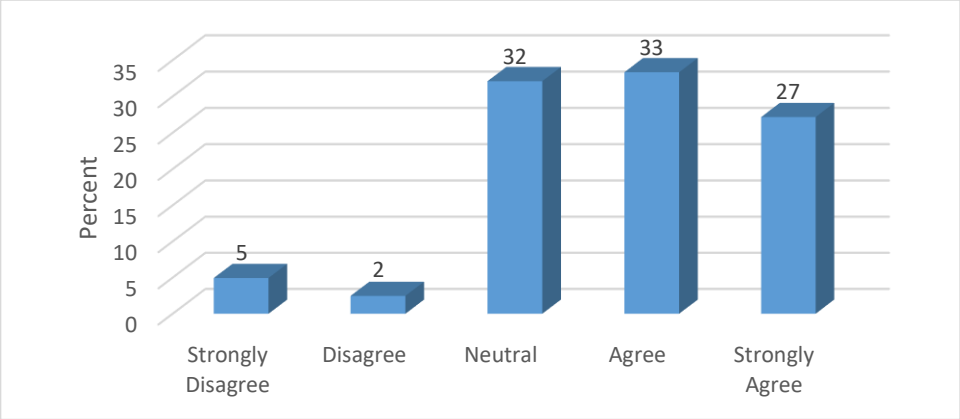

Figure 4.7: Reduction in customer complaints

Source: *Research Findings*

4.3.3 Financial performance

On financial performance, the researcher considered the following characteristics: better financial performance, improved productivity, increased income, reduced production and service delivery costs, reduced logistics costs, increased gross profit, and monitoring of variance against budget on a real time basis. The results revealed that IS does affect financial performance. Although, the majority of respondents agreed (agree or strongly agree) on the various statements characterising the impact of IS on financial performance, a significant number remained neutral to the majority of the statements. Below are some of the graphical presentations on the findings of the impact of IS on financial performance: -

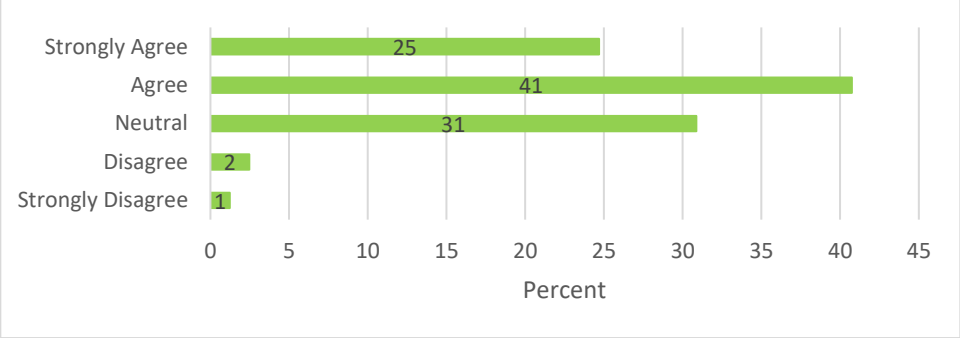

Figure 4.8: Increased company income

Source: *Research Findings*

Figure 4.8 shows that the majority of the respondents either agreed (41%, n =33) or strongly agreed (25%, n =20) that IS has increased company income. The financial statements of the company support this; refer to Table 4.5, which shows the company comparative growth or decline in terms of financial and technical ranging from the year 2013 to 2017. In addition, it is worth noting that the second largest group of respondents 31% (n =25) were neutral to this statement.

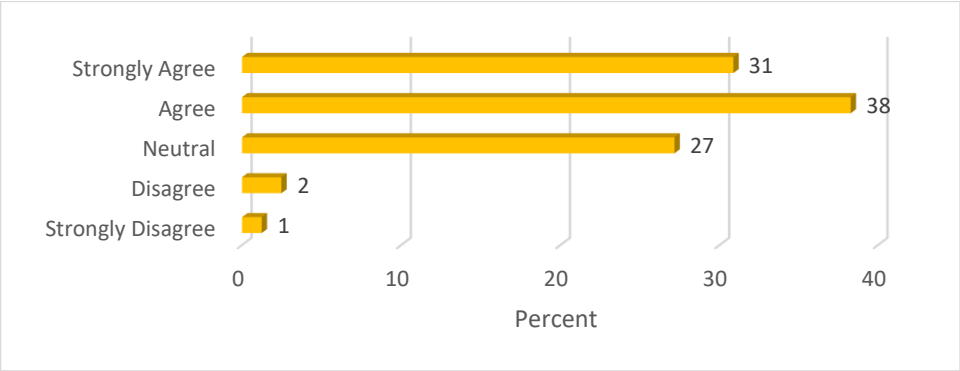

Figure 4.9: Logistics cost reduction

Source: *Research Findings*

Figure 4.9 shows that the majority of the respondents either agreed (38%, n =31) or strongly agreed (31%, n =25) that IS has reduced logistics costs. In addition, it is worth noting that the third largest group of respondents 27% (n =22) were neutral to this statement. Figure 4.10 shows that most of the respondents either agreed (41%, n =33) or strongly agreed (19%, n =15) that the use of IS has increased gross profit. The company's financial records support this as shown in Table 4.5. It is worth noting that the second largest group of respondents 37% (n =30) were neutral to this statement

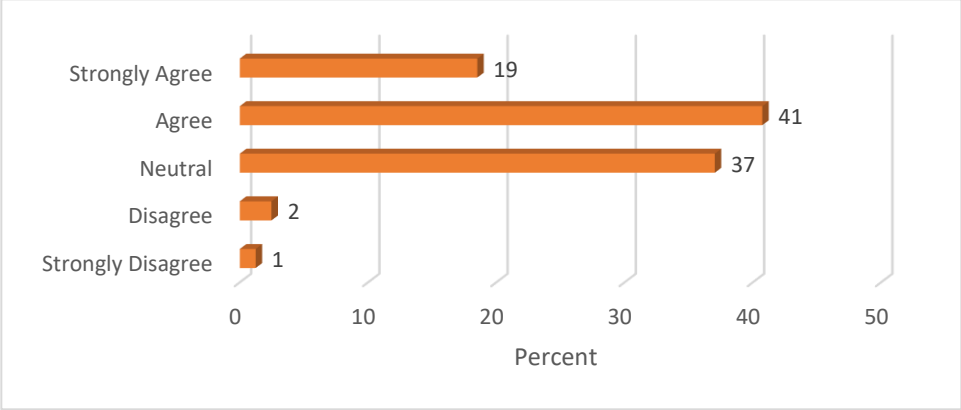

Figure 4.10: Increase in gross profit

Source: *Research Findings*

Table 4.5: Company comparative growth/decline

	2012/13	2013/14	2014/15	2015/16	2016/17
Financials					
	N$'000	N$'000	N$'000	N$'000	N$'000
Revenue	1,309,519	1,352,636	1,419,762	1,517,558	1,502,614
Operating profit/Loss	(85,478)	(601,808)	(70,337)	(18,347)	49,681
Total Comprehensive (Loss)/ Income for the year	(120,894)	(555,645)	(83,928)	(41,240)	8,984
Tangible & Intangible Assets	1,802,215	1,911,029	1,749,947	1,628,044	1,440,591
Long-term borrowings	457,000	159,000	147,652	125,682	95,651
Equity	1,131,572	575,927	891,999	850,759	296,229
Capital Expenditure	445,356	330,873	164,021	146,153	66,519
Technical					
Port Capacity (Network Switch Capacity)	215,150	213,953	158,786	-	280,489
Percentage Digital	100%	100%	100%	100%	100%
Fixed Broadband Subscribers	31,764	39,713	47,249	54,013	49,727
Mobile Subscribers	-	-	100,429	159,913	187,238
Direct Exchange Lines (DEL's)	180,110	190,665	198,800	200,502	191,947
Equity	1,131,572	575,927	891,999	850,759	296,229
Capital Expenditure	445,356	330,873	164,021	146,153	66,519

Source: adapted from *Telecom Namibia (2017)*

4.3.4 Learning & Growth

In terms of learning and growth, the researcher considered the following characteristics: knowledge management, enhancement of information sharing, enablement of staff to deliberate on work activities and challenges regarding their geographical locations. The researcher further considered enablement of experts-based

systems to coach and support TN employees in tackling and resolving activities successfully, facilitation of learning and knowledge transfer, collective group discussions and collaborative activities. The results revealed that IS affects learning and growth. Although, the majority of respondents agreed (agree or strongly agree) on the various statements characterising the impact of IS on learning and growth, a significant number remained neutral to the majority of the statements. Below are some of the graphical presentations on the findings of the impact of IS on learning and growth: -

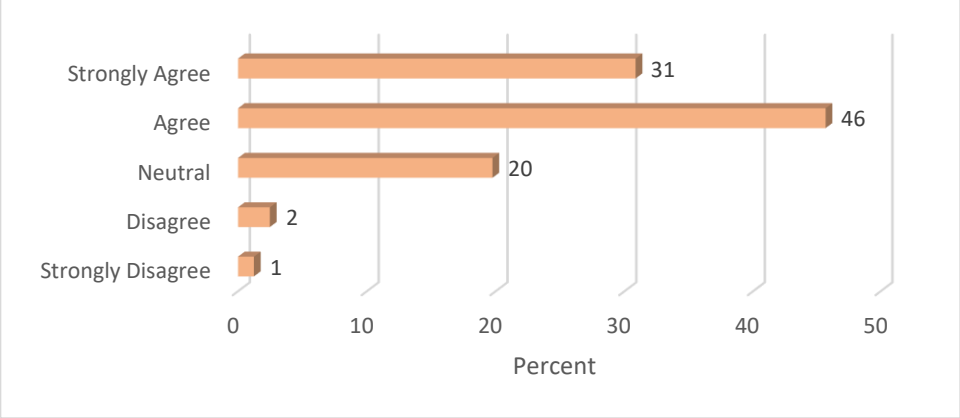

Figure 4.11: Facilitation of information sharing through the supply chain

Source: *Research Findings*

Figure 4.11 shows that most of the respondents either agreed (461%, n =30) or strongly agreed (31%, n =26) that the use of IS had facilitated information sharing through the supply chain. It is worth noting that the second largest group of respondents 20% (n =22) were neutral to this statement. Figure 4.12 shows that most of the respondents either agreed 49%, n =40) or strongly agreed (31%, n =25) that the use of IS has facilitated learning and knowledge. It is worth noting that the second largest group of respondents 16% (n =13) were neutral to this statement.

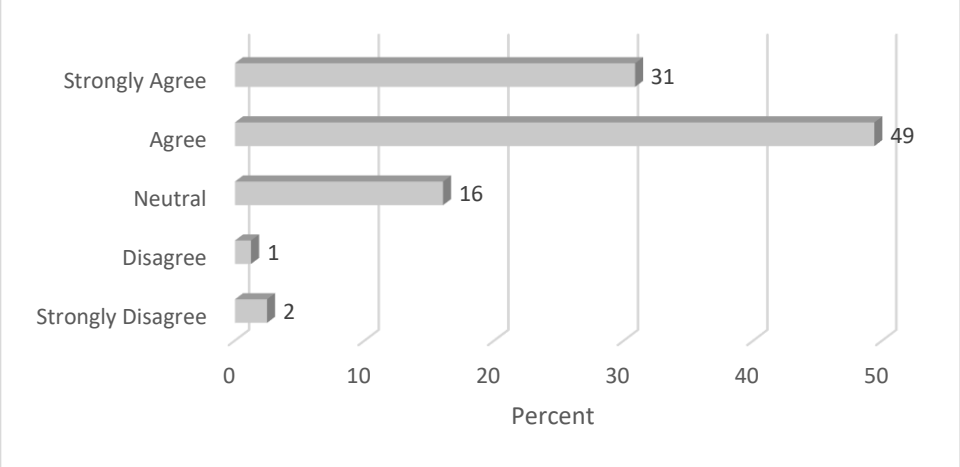

Figure 4.12: Facilitation of learning and knowledge transfer

Source: *Research Findings*

4.3.5 Internal Business Processes

In terms of internal business processes, the following characteristics were considered: decision making process, staff productivity and flexibility. The researcher further considered information flow, cooperation among departments, forecasting and innovation capability, scheduling, data collection and processing as other factors of the internal business processes. Monitoring and reporting, operational efficiency, achieving strategic goals, communication, customer reachability and collaboration with suppliers as well as delivery of products and services were also considered. The results revealed that IS does impact business processes. Although, the majority of respondents agreed (agree or strongly agree) on the various statements characterising the impact of IS on learning and growth, a noticeable number remained neutral to the majority of the statements. The

findings were in line with Gakuo (2011) who found that IS can be used to enhance collaboration with partners as well as enhance communication and coordination in firms. Below are some of the graphical presentations on the findings of the impact of IS on financial performance: -

Figure 4.13 shows that most of the respondents either agreed (37%, n =30) or strongly agreed (32%, n =26) that the use of IS has made the decision making process faster. It is worth noting that the second largest group of respondents 27% (n =22) were neutral to this statement

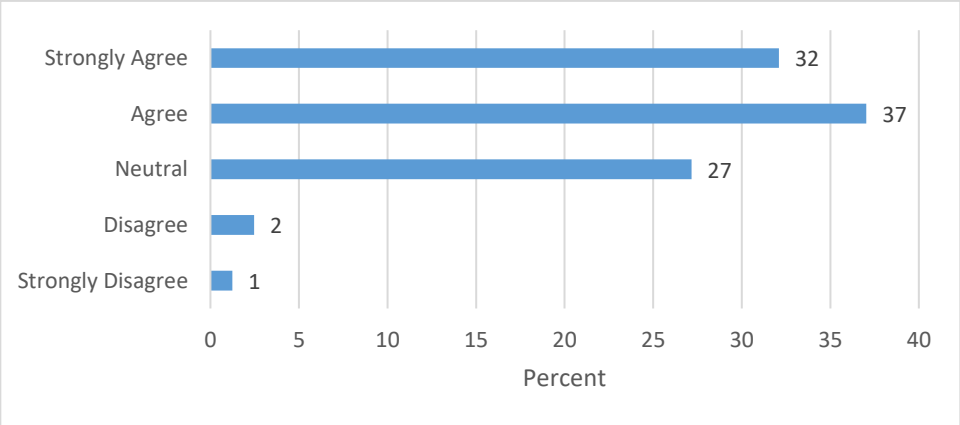

Figure 4.13: Decision making process

Source: *Research Findings*

Figure 4.14 shows that most of the respondents either agreed (37%, n =30) or strongly agreed (36%, n =29) that the use of IS has enabled forecasting capability and innovation capacity. The researcher noted that the second largest group of respondents 22% (n =18) were neutral to this statement.

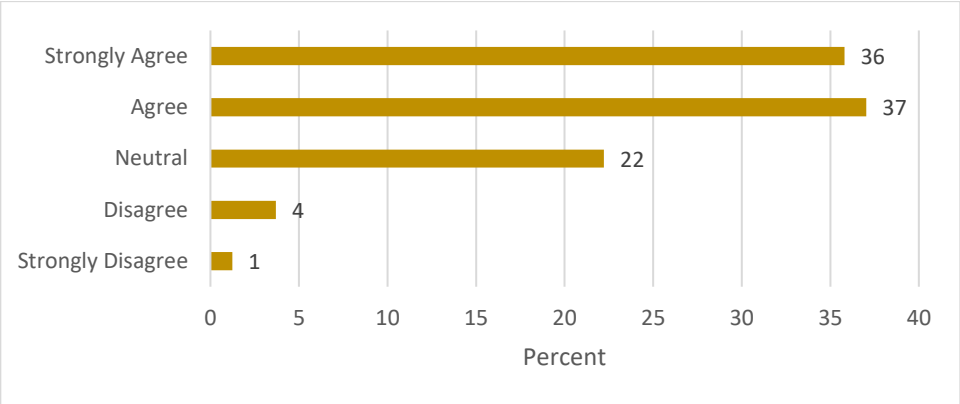

Figure 4.14: Capacity forecasting and innovation capacity

Source: *Research Findings*

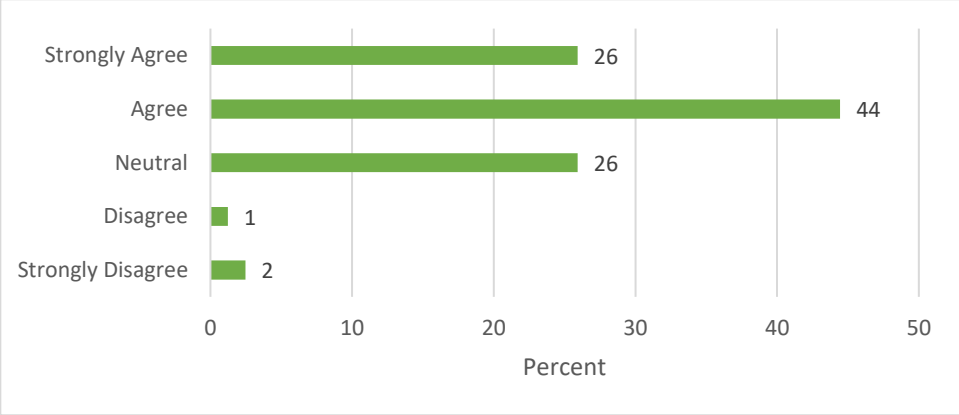

Figure 4.15: Achievement of strategic goals

Source: *Research Findings*

Figure 4.15 shows that most of the respondents either agreed (44%, n =36) or strongly agreed (26%, n =21) that the use of IS has improved the achievement of strategic goals. The second largest group of respondents 26% (n =21) were neutral to this statement.

4.4 Relationship between IS and Organisational Performance

Based on the conceptual framework, five (5) hypotheses were tested to investigate the impact of IS on organisational performance at TN. The research conducted a correlation and hypothesis testing to test the relationship between IS use and organisational performance at TN. The researcher applied the statistical package for social sciences (SPSS V21.0) to compute correlations for the study. The hypotheses were:

- $\mathbf{H_{1.0}}$: Information Systems do not have a positive impact on user performance.
- $\mathbf{H_{1.1}}$: Information Systems have a positive impact on user performance.
- $\mathbf{H_{2.0}}$: Information System do not have a positive impact on customer satisfaction.
- $\mathbf{H_{2.1}}$: Information Systems have a positive impact on customer satisfaction.
- $\mathbf{H_{3.0}}$: Information Systems do not have a positive impact on financial performance.
- $\mathbf{H_{3.1}}$: Information Systems have a positive impact on financial performance.
- $\mathbf{H_{4.0}}$: Information Systems do not have a positive impact on learning and growth.
- $\mathbf{H_{4.1}}$: Information Systems have positive impact on learning and growth.
- $\mathbf{H_{5.0}}$: Information Systems do not have positive impact on internal business processes.
- $\mathbf{H_{5.1}}$: Information Systems have a positive impact on internal business processes.

4.4.1 Descriptive Analysis on Main Variables

Table 4.6 shows that the mean levels of the main variables were all moderately high and not significantly lower than three (3) for the study sample. This suggests that respondents agree that IS has an impact on users' performance, customers, financial performance, learning & growth, and internal business performance.

Table 4.6: Descriptive Statistics of Study Variables

One-Sample Statistics				
Study Variables	N	Mean	Std. Deviation	Std. Error Mean
Impact Users	81	4.4198	0.55940	0.06216
Impact Customers	81	4.2006	0.65062	0.07229
Impact Financial Performance	81	3.9444	0.77639	0.08627
Impact Learning & Growth	81	4.0185	0.73024	0.08114
Impact Internal Business Processes	81	4.1092	0.71106	0.07901

Source: *Research Findings*

4.4.2 Inferential Analysis on Main Variables

A One-Sample T-Test was carried out to test for significant differences of the main variables to a mean level of three (3). A mean level of three (3) is the minimum threshold established from the 5-point Likert scale to separate those who generally agree (i.e. strongly agree and agree) as compared to those who disagree (i.e. strongly disagree and disagree).

Table 4.7: One Sample T-Tests for theoretical variables

Variable	N	One-Sample T-Test Statistics					
		Test Value = 3					
		t-value	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Impact Users	81	22.842	80	0.000	1.41975	1.2961	1.5434
Impact Customers	81	16.608	80	0.000	1.20062	1.0568	1.3445
Impact Financial Performance	81	10.948	80	0.000	0.94444	0.7728	1.1161
Impact Learning & Growth	81	12.553	80	0.000	1.01852	0.8570	1.1800
Impact Internal Business Processes	81	14.040	80	0.000	1.10921	0.9520	1.2664

Source: *Research Findings*

Moving from left to right, Table 4.7 presents the observed t-value ("t" column), the degree of freedom ("df"), and the statistical significance (p-value) as ("Sig. (2-tailed)") of the one sample t-test. It this case all the main variables' p-values are equal to 0.000 (p=0.000) which is less than 0.05 (p<0.05) therefore, it can be concluded that there was a statistically significant difference between the mean and so the researcher rejected the null hypothesis of the research and accept the alternative hypothesis as shown in Table 4.8.

Table 4.8: Results of Hypotheses Testing

Hypothesis		T-statistic	Test Results
Hypothesis 1	$H_{1.0}$: IS does not have a positive impact on user's performance. $H_1.1$: IS does have a positive impact on user's performance.	22.842	Reject $H_{1.0}$

Hypothesis 2	$H_{2.0}$: IS does not have a positive impact on customers. $H_{2.1}$: IS has a positive impact on customers.	16.608	Reject $H_{2.0}$
Hypothesis 3	$H_{3.0}$: IS does not have a positive impact on financial performance. $H_{3.1}$: IS has a positive impact on financial performance.	10.948	Reject $H_{3.0}$
Hypothesis 4	$H_{4.0}$: IS does not have a positive impact on learning and growth. $H_{4.1}$: IS has a positive impact on learning and growth.	12.553	Reject $H_{4.0}$
Hypothesis 5	$H_{5.0}$: IS does not have a positive impact on internal business processes. $H_{5.1}$: IS has a positive impact on internal business processes.	14.040	Reject $H_{5.0}$

Source: *Research Finding*

Therefore: -

1. According to the t-statistic value of 22.842, its null hypothesis ($H_{1.0}$) is rejected. Thus, it can be said that information systems at 95% confidence level has a significant positive relationship with user's performance.
2. There is a significant relationship between information systems and customer satisfaction. According to the t-statistic value of 16.608 the null hypothesis ($H_{2.0}$) is rejected; hence, it can be concluded that information systems have a positive and significant relationship with customer satisfaction at 95 percent.

3. According to the t-statistic value of 10.948 its null hypothesis ($H_{3.0}$) is rejected and it can be concluded that information systems at 95% confidence level have a significant positive relationship with financial performance.
4. According to the t-statistic value of 12.553 its null hypothesis ($H_{4.0}$) is rejected. Thus, it can be said that information systems and organisational learning and growth have a positive and significant relationship, with 95% confidence level.
5. There is a significant relationship between information systems and internal business processes. According to the t-statistic value of 14.040 its null hypothesis ($H_{5.0}$) is rejected. Hence, it can be said that information systems have a positive and significant relationship, with 95% confidence level.

4.5 Qualitative Analysis

This section presents the results of the interviews, which was presented in the form of qualitative analysis. Content analysis was used. Interviewees contributed different amounts of information to the themes that comprise the narrative. Some participants talked at length on one or two themes, some made nearly equal contributions across all the themes. Thus, all participants' voice and views are represented in the study. The responses of the managers are analysed further in this chapter using content analysis. For reporting purposes, and to protect participants' identities, each participant was assigned an alias.

4.5.1 Demographic characteristics

The six (6) interviewees consisted of senior managers and heads of departments from three business units, namely: Technical Operations, Commercial, and Corporate Communication and Public Relations. All of them had worked at TN for a period ranging from 10 to 26 years. Thus, they all enough experience to respond to the interview questions without any challenges.

4.5.2 Interviews Findings

Five themes emerged from the data:

- Theme 1: Most and least successful IT interventions in TN
- Theme 2: Impact of IS on performance at TN
- Theme 3: The barriers that hinder the adoption and effective use of IS
- Theme 4: IT strategies and techniques to measure the IT impact
- Theme 5: Performance Measurement at TN

Furthermore, participants' responses to interview questions often addresses more than one theme. In those cases, the interview data is described where it appears to fit most logically.

Theme 1: Of all the IS used, which one was the most and least successful one, and why?

This theme is discussed in two parts: (1) most successful systems, and (2) least successful as well as the reasons.

The most successful IS interventions:

On the question of which IS was most successful and why, the participants responded as follows: *Participant A* indicated the Systems Applications and Products (SAP) system, as it was stable, mature, user friendly, and does more from the business perspective. *Participant D* revealed the Transport Network Management System (TNMS) for the Dense Wavelength Division Multiplexing (DWDM) network, because staff were well trained, the system was well documented, planned and implemented.

Participant F emphasised that all systems were successful, as they were working and used to attend to customers' enquiries. *Participant E* listed Desktop publishing, internet, emails, Office Administration systems and SAP, as they are useful for their respective purposes. In addition, desktop publishing enabled TN to depict its products in artwork that can be used to excite customers and generate sales. *Participant B* indicated Active directory and emails, as they are up to date and secure. *Participant C*, reported SAP because of its procurement process transparency, the staff involved ensured that the best system to the business requirements was selected, and SAP vendors were conversant in the English language and this made it easier to relay the requirements.

Furthermore, SAP is a proven off the shelf application, availability of expertise to implement and support the system, system was well documented, and proper training was conducted. Although, participants used similar systems there was no single system considered successful by all, what was clear were the reasons and characteristics that made the listed systems to be considered successful.

The least successful IS interventions:

Regarding which IS at TN was considered least successful and why, the findings disclosed the following; *Participant A*, pointed out the billing system because of the transitioning process from the old billing system. The participant further highlighted, that the migration of data from Integrated Customer Management System (ICMS) to the Next-Generation Business Support System (NGBSS) also known as Calabash, was not well structured. In addition, most of the data was incomplete or corrupted and customers were billed for the wrong services, while others were not billed, which led to loss of revenue and frustrated customers. Furthermore, no proper support or training was provided for the NGBSS.

Similarly, *Participant C* agreed with *Participant A*, acknowledging the NGBSS because its procurement process was flawed, and the vendor was not very well conversant in the English language making it difficult to relay the requirements. Secondly, the conflicting interests and internal higher authority ensuring their favourite vendors are awarded the tender and not really that they proposed the best solution. Thirdly, the data migration was not done properly, resulting in incomplete data. Fourthly, in terms of training, no expert training was provided to allow TN staff to be able to support the system, hence handicapping the staff and making them heavily dependent on the vendor for support until today.

Participant D reported the Asymmetric Digital Subscriber Line (ADSL) management system the N2000, due to lack of training and the fact that the project was not closed off for several years because of issues between TN and the vendor. *Participant*

B listed the SAP system because of its obsolete hardware that needed to be replaced and that it is a risk to the business to continue operating the platform. In contradiction, Participant *E* stated that all systems were useful for their purposes and enhance the business operations daily. Similarly, Participant F highlighted that none of the systems were unsuccessful, but was concerned regarding too many systems and that it would have been easier if all systems could have been integrated onto one system. Even though, there was no single system considered least successful by all, the research disclosed some of the reasons and characteristics that can make a system to be considered least successful.

Theme 2: The impact of IS on Organisational Performance at TN

The Participants revealed various cases discussing how some information system interventions made an impact on the business. *Participant F* revealed that information systems help managers obtain adequate information in a timely manner, facilitate fast reporting, analysis, planning, better decision-making, improved data quality, monitoring of network and IT services. This is in line with findings by Asemi, Safari, and Zavareh (2011) that managers at all levels of an organisation's hierarchy need precise and suitable data and information to make decisions that increase performance. Likewise, Participant *F* added that, IS help TN to provide its customers with the latest products enabled TN to meet its customer demand, increase competitive advantage, honour customers' service delivery deadlines and overall improve customer satisfaction.

Participant A revealed that using the Customer Relationship Management (CRM) system, TN had implemented a self-service portal for its customers to log in and air their needs and wants and the collected data could be analysed to determine the customer

preferences and be used to improve customer experience with personalised products. *Participant B* further revealed that WOMS enables technicians to be more efficient in managing and maintaining the networks. Furthermore, IS usage aids sales forecasting and resource monitoring, ensuring that resources are not over-or underutilised. In addition, IS has reduced logistic time, enabled easy management of events and the ability to control stocks and their products required for service delivery.

Participant D stated: “IT has facilitated the sales of TN’s products and services”. Similarly, each technology comes with its own stand-alone management system (NMS/EMS). Some EMS are integrated to other systems such as the NGBSS and email server, making it easier to operate and maintain the network. For instance, those integrated to the email server, generate alarms and send email notifications in case of network failure or in case monitoring thresholds are reached for proactive measures. Therefore, NMS/EMS’ have improved the management and monitoring of network elements, thus reducing downtime of customer services. Furthermore, through the NMS/ EMS’ graphical user interface (GUI), operators are able to perform complex tasks with ease, compared to using a command line interface (CLI), making work easier and faster.

Participant B stated that IT is a business enabler, and one can programme and automate systems to improve the business processes. More specifically, *Participant B* highlighted the introduction of budget control via SAP, which made it easier to control and account for projects and cost centres’ budgets. Secondly, she revealed the implementation of an employee self-service (ESS) portal that enables employees to apply for leave, overtime, and view their monthly pay slips. *Participant B* further stated: “this has eliminated the lengthy manual process, ensured that records are readily available and

can be easily extracted, saves paper and cartridges as no printing is required, hence improving the business processes, information availability, and reducing operational costs".

Participant C highlighted the introduction of "paperless procurement" through the SAP system. This eliminated the need for hard copies with manual signatures, as all the required documents can be attached to a specific purchase requisition on the system. Within SAP, a work-flow is configured as per the delegation of authority and once the purchase requisition is created and saved, an email notification gets sent to the individual responsible for releasing the purchase requisition. With all the necessary documents attached, the individual has all the information to approve or reject the request. This has tremendously reduced the turnover time for purchase-order creations. Again, reports can be extracted to determine the response time of each individual involved in this process. Documents are no longer getting lost and requests can be approved or rejected, while the responsible person is in a meeting or on leave, as long as they have access to the system. This had drastically improved the procurement processes, hence the business processes.

Participant C disclosed that the introduction of the "print server" system reduced the number of printers in the network at TN: "The need for each department or staff member to have a printer in his or her office is outdated. TN is now renting network printers from a supplier, and they are positioned at strategic points within the organisation. Every user can print any document and the print job is pulled to a central print server. This job does not print unless released on any of these printers by the individual that printed it by entering a pin code. This has introduced secure printing and flexibility for staff members to be able to work from anywhere within the organisation, print their jobs and

collect it wherever they are, they do not have to be restricted to their office printer. As a result, costs are reduced by reducing the number of printers, maintenance for these printers, and operating these printers (paper, cartridges, etc.). This has translated into improved business processes and reduced Operational Costs (OPEX)".

Participant C further revealed that the introduction of NGBSS Automatic Activation (AA) of service was a revolution, an intervention geared to automatically provision services onto the active access networks. "Technically, AA is a physical server, which resides between CRM and the element management system (EMS) and it is integrated to both environments. This introduced machine-to-machine communication. On the CRM (Sales) side, agents in the Teleshop load an order on the system, which has all the necessary parameters for the required customer service. AA gathers the service parameters from CRM and translates them into technical provisioning commands, which it sends to the EMS. Consequently, the commands are executed by the EMS and it provides a confirmation message back to the CRM system via AA, to confirm whether the requested services were executed successfully or failed, with a specific reason. Once the commands execute successfully, the system then forwards such orders to the Technical division responsible for fieldwork to complete the service installation. Upon completion of the installation, the responsible technician confirms on the system, and the system completes and closes the order process and initiates the billing process. It is evident that what used to take hours and days to complete is now done within seconds. This has improved the number of service orders processed, has reduced the amount of time to complete the job, and reduced the lengthy paper work process. Furthermore, it has reduced

the workers usually required to execute the above-mentioned functions, translating into cost saving".

Participant E stated that "through IS, staff are able to communicate visually and electronically with the internal and external stakeholders, leading to a more efficient and effective Corporate Communication and Public Relations' department. Whilst, in the past getting in touch with the media and the general public required hand delivery of documents and direct communication using telephones, which required more manual involvement and conversion of input to tangible paperwork. Additionally, through IS the department was able to cut production costs by outsourcing less production of media material to advertising agencies. This is because TN has managed to be directly in touch with the customers through a cost effective electronic manner on a daily basis to provide first hand and instant information and support. Prior to these systems, getting in touch with our customers for support was an endeavour confined to telephonic and postal means. Moreover, as a company provisioning IT services itself, TN has benefited greatly from some of the services it has implemented in terms of innovative new ways of provisioning, ease of use and enhancement of service experience for the customers. Hence, assuring reliability of services, customer satisfaction and reduction of costs to the customers".

Furthermore, most of the Participants revealed that use of applications such as Skype, Team Viewer and video/conference call for business help TN with information sharing. In addition, experts based overseas can coach and support TN staff in tackling activities successfully. Likewise, these applications have enabled employees to communicate about certain jobs and challenges even if they are residing in different regions, thus employees do not need to be in one office or region to execute certain tasks.

This has reduced the time it takes to execute tasks and the related costs involved. Similarly, IS has facilitated teamwork and collaboration between employees around the country, which cut down on delivery time. Additionally, the use of email ensures successful communication of directives to all staff members. In addition, emails, text messaging and social networks help keep TN connected to their customer base and improve internal communication within TN.

Furthermore, communication is easier as contact details of employees are readily available on a centralised system, which hastens communication in the company. Overall, service delivery has improved because of real time exchange of information between TN and customers as well as the vendors. These findings are supported by Kariuki (2015) that IS facilitate communication and the exchange of information between various departments and functions in the organisation and in this light, acts as an enhancer of collaboration and networking tool amongst employees, customers and partners because it removes the barriers to real-time communication and effective information sharing.

Theme 3: The barriers that hinders the adoption and effective use of IS at Telecom Namibia

Participant A highlighted that although TN has advanced systems, there are several barriers including systems that are not delivered according to specifications, systems not properly supported by their suppliers and inadequate training offered. *Participant D* supported *Participant A* on the insufficient training as a barrier, in addition to the user unfriendliness of systems. Furthermore, *Participant D* indicated the vendor's relationship and the intellectual property of the supplier where they are limiting users on

what they can do on the systems, giving an example of NGBSS. *Participant F* observed lack of knowledge. *Participant B* reported limited professional services or lack thereof, the organisational structure, less work force, procurement policy, lack of funds, lengthy processes, insufficient training, a lack of experience, errors in system design, and the managing of contracts with suppliers. *Participant E* recognised that new versions are released and more features are made available, hence, staying abreast with these new features requires upgrading our licenses and acquiring training. The barriers that stand in the way of effective use of IS' are the extent to which employees can use the system to increase their effectiveness within the organisations. *Participant E* further stated that another barrier is the transitioning process from one system to another, connectivity to the system, and user unfriendliness of systems.

Participant C supported *Participant B's* opinions and revealed that TN is cost conscious and tries very much to reduce its costs, as it influences the bottom line. In some instances, this has led users to remain with outdated workstations (computers/laptops), as the business deems them to be still operational, while they are not compatible with the IS platform requirements, in terms of hardware (CPU, RAM, ROM, etc.) and software (Windows, Java, Browser, etc.). The result is that the user experiences of an IS becomes bad and users avoid using it. Similarly, all the respondents acknowledged training as another common barrier to IS adoption. Again, with the move to reduce costs, TN tries to curb the spending budget on training interventions and pushes more for self-study and e-learning, which is not well received by all employees at TN. This has led to having people who are not well conversant with certain IS, which resulted to low utilisation. The research

also highlights that some employees are trained for systems they do not use nor have access to and as a result, it does not add value to the use of IS.

Participant C further added that network connectivity is another critical barrier. To access most, if not all, IS require an individual to have an internet or intranet connection. This can be directly within either the organisation's internal network (intranet), or remote access via internet. The speed on the network is also key to how effective a system is utilised because the users directly link system performance to the network they use to connect to such a system. Secondly, in order to connect to the network and access an IS, individuals need a device capable (computer/laptop/smart-phone, etc.) of communicating with the IS and present the interface to them. Lastly, the user needs to be conversant with the specific IS to effectively use it. Access to the telecommunications networks in Namibia is currently limited in certain areas, specifically in the more rural or remote areas, where TN either has no network coverage, or still has obsolete networks which are not capable of providing internet, or are only able to provide very limited and slow internet connectivity. The impact is that a user will not have access at all, or with the slow internet connectivity, they will be frustrated as the response of the IS will be very slow, which at the end results in staff not using the system at all.

Theme 4: Strategies and /or techniques to measure IS impact

The participants were asked if there are techniques or strategies to measure the impact of IS. In general, participants revealed that there is no common strategy used to measure IS impact at TN. However, in the absence of a defined strategy, *Participant A* stated, "from the process perspective one can notice the impact". Furthermore, "based on

the employees' requirements, one can notice the impact, because in the past more staff was required compared to nowadays as most of the functions are executed by systems. On the contrary, *Participant B* stated, "in the absence of a defined strategy, we follow the Institute for Technology-Enhanced Learning (ITEL) and Cobit best practice framework and are also guided by the company strategy, the IT Masterplan, and the IT audit reports". *Participant C* added that "in order to measure the impact of IT in TN," we can only do so by means of comparing the historical key performance indicators (KPI's) prior to IS deployment with the current KPI's after IS deployment. At this point in time, "I am not aware of such comparison being done, although we have data for certain processes, which can enable us to do exactly that". According *to Participant E*, "currently we do manual statistical estimations using social media reading per post and website page impressions. We are however, still investigating a system to give us in-depth, unified and summarised analysis of the social growth and website ranking". *Participant F* further reported the use of the TrackIP system, which measures performance of IS for internal escalations.

Theme 5: Performance Measurement at TN

Interviewees were asked, "How is the Balanced Scorecard (BSC) tool used to assess and evaluate corporate performance at TN?" The majority of Participants indicated that they were not sure if the BSC is still used at TN. *Participant D,* said, "Though not used widely these days, the BSC at TN is used as a vehicle to measure people's performance, effectiveness of the internal process, financial perspective and a view on customers' satisfaction". *Participant B* highlighted the use of a performance management system (PMS) to measure employees' performance instead. *Participant F* felt the information was too sensitive to share.

Participant E expressed that management annually identifies a set of quantifiable measures derived from an organisation's strategy for the BSC. The measures selected for the BSC represent a tool for the executive committee (EXCO) to use in communicating to employees and external stakeholders the outcomes and performance drivers by which TN will achieve its mission and strategic objectives. The BSC tool is thus implemented as a measurement system, serving as a strategic management system, communication or information tool. TN management uses the tool to track company performance from four perspectives, namely: customer, internal process, financial, and learning and growth. "We track the impact of non-financial perspectives on financial performance". These critical non-financial factors including customer satisfaction, efficient internal processes and the quality of staff play a crucial role. Of specific interest is the turn-around-time on fault rectification and service installations. These measures give EXCO a fast but comprehensive view of TN's performance, includes both process, and results measures. The complexity of managing an organisation requires that EXCO be able to view performance in several areas simultaneously. A BSC or a balanced set of measures provides that valuable information.

Participant C agreed with *Participant D* and *Participant E's* views stating that as per the agreed standard, "we measured four (4) Business Focus Areas namely: customers, financials, people and internal Processes". He explained further that, in terms of customers, the major focus area was customer satisfaction, which was done via surveys for external customers and with 360 ratings (peers, sub-ordinates and supervisors) for internal customers. With regard to finances, the participant focused on OPEX, by understanding how well the organisation was doing, in terms of the actual OPEX and

planned OPEX, which was a function per each cost centre; the participant also focused on measuring the Capital Budget Expenditure (CAPEX), also in terms of actual and planned; the participant further focused on measuring the revenue (Sales) budget in terms of actual and planned. In relation to the people's quadrant, the participant focused more on determining whether the organisation was creating a conducive environment in which employees could be happy in order to promote and motivate for good performance. This was done by looking at training and development, which the organisation arranged for staff members, how well everybody in the organisations was living the TN values of care, teamwork, and mutual respect. Lastly, the participant measured the internal processes. All processes, involved in getting things done in the business. Internal processes included service delivery (new service orders), service rectification (service complaints), debt collection, resolution of financial disputes raised by customers, capitalization of projects to change work in progress (WIP) into assets. In addition, annually, at a Strategic Meeting, the direction for the new financial year is set at the level of the Managing Director (MD), with all the KPI's for each key performance area. Subsequently, they are cascaded down to the lower levels, with a focus on keeping them all aligned to the MD's BSC, which the participant called BSC1.

On the contrary, to *Participant D* and *E*, *Participant C* pointed out that "we never had the correct tools to correctly and timely measure the actual KPIs achieved, whether daily, weekly or monthly. Firstly, it was always a huge manual headache to populate the results on excel, which at times had many arithmetic errors. Secondly, with the absence of an automatic tool, there was always a lot of manual formulae and calculations, with various individuals having various perceptions, which resulted in disagreements in terms

of the calculated achieved results. Thirdly, some KPIs' definitions were not very clear, not measurable and the output data source not defined, hence some results became very questionable, to the extent where the BSC1 was completely non-performing. Although, everyone beneath the BSC1 was having a very good performance, some areas had good performance and not so good in other areas. As a result, everybody started to disengage slowly from the use of the BSC, which is the case until today. This finding is supported in two case studies; Pujas (2010) stated that despite its worldwide popularity and it being recognised as a powerful management tool, the BSC is not always used successfully. Furthermore, although many organisations have adopted the BSC framework, a significant number of them have encountered different problems when trying to introduce the concept in their business. Hence, a majority of businesses either have implemented the BSC without achieving any significant performance improvement, or have abandoned it at the implementation phase (Pujas, 2010).

4.6 Summary

This chapter presented in details all the statistics performed and qualitative descriptions to explore how information systems influenced performance at Telecom Namibia. The following chapter gives a summary of the major findings in relation to the proposed research objectives, conclusions, recommendations, and directions for future research.

CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives the summary, conclusions and recommendations of the study. The findings were based on the research questions of the research which were to assess the impact of IS on Organisational Performance at TN; and to determine if there was a positive relationship between IS and Organisational Performance at TN.

5.2 Summary of major findings

This research aimed at assessing the impact of information systems on the organisational performance at TN. It adopted a simple random sampling technique, which resulted in a sample size of 81 employees for the questionnaire and six (6) Managers purposively sampled for the interviews. Quantitative data was collected using an online-administered questionnaire, while qualitative data was collected through interviews. Eighty-one (81) questionnaires were returned and six (6) interviews were conducted. That represented a response rate of 54%, which was sufficient to yield the results sought. Questionnaire data was analysed using SPSS for descriptive and inferential statistics whereas, content analysis was used to summarise and categorise the interview data.

The findings revealed that the majority of the respondents to the questionnaires were technical and commercial people, holding either a subordinate or middle

management position, and with over five (5) years' working experience at TN. Furthermore, interviewees were senior managers and heads of departments with over 10 to 26 years work experience. The participants either implemented the systems or made use of it on a daily basis. Therefore, they were in a position to make a comparison and testify on their experience and the impact of IS.

The research revealed that Telecom Namibia had adopted IS to a large extent and use of IS had significantly influenced the five (5) domains of organisational performance as assessed by the research. In terms of user performance, the findings revealed that the use of IS had improved overall user performance through ease of work; enhanced learning, knowledge transfer and decision-making; improved staff confidence levels and quality of work. On customers, the research found that the use of IS had improved quality and delivery of goods and services; facilitated better communication with customers and customer care; moderately helped with customer retention; and reduced customer complaints. On financial performance, the research established that IS use had enhanced monitoring of budget variation on a real time basis; increased company income and gross profit, reduced operational costs through the reduction of logistics, production and service delivery costs. The increase in revenue, income and reduction in operating costs is supported by TN's financial information from the annual reports.

In terms of learning and growth, the findings revealed that the use of IS has enhanced information sharing, learning and knowledge management; enabled staff and experts based overseas to deliberate on work challenges, coach and support each other in tackling and resolving matters regardless of their geographical locations, this is done through collective group discussion and collaborative problem solving. As a result, staff

do not need to travel to acquire the necessary knowledge to complete their tasks, thus, reducing time and costs. On internal business processes, the research discloses that the use of IS has enhanced the decision making processes; enabled forecasting and innovation; improved data collection and processing, scheduling, monitoring and reporting, service delivery, productivity, flexibility, information flow, communication, achieving of goals, automation of processes and overall operational efficiency.

Organisational performance is comprised of five (5) domains namely: user performance, internal business processes, financial performance, learning and growth, and customers. Qualitatively, participants were leaning towards a positive relationship between IS usage and organisational performance by highlighting various IS initiatives such as paperless procurement, print server, network monitoring, and automatic activation of services and how they affected the business operations. Quantitatively, One-Sample t-test correlation studies showed that there is positive and significant relationship between IS use and organisational performance. The research therefore proved that the use of information systems has a significant positive and direct impact on performance.

However, despite the many benefits of IS, there are still barriers, hindering the adoption and effective use of IS. The following emerged as the barriers: lack of training, the use of outdated (hardware and software) systems, TN's cost reduction initiative, vendor proprietary protocols and poor network connectivity. The research further revealed the absence of a strategy used in determining IS impact; however, in the absence of a common strategy, the impact is determined by comparing historical KPIs prior to IS implementation versus the KPIs after IS implementation. Lastly, the research found that the majority of respondents have disengaged from the use of the Balanced Scorecard

(BSC) framework, a performance measurement tool. The reason for the disengagement that emerged was the absence of a common tool that accurately and timely measures the actual KPI's achieved, whether daily, weekly, or monthly. Furthermore, the absence of a common tool led to the use of manual formulae and calculations, as well as various predictions, which resulted in disagreements in terms of the calculated achieved results, leading to the disengagement from the use of the BSC framework.

5.3 Research Achievements

This section unpacks the achievements of this research. One of the notable achievements was to address the main research objective, which was to assess the impact of Information Systems on organisational performance at TN. Additionally, to determine if there is a positive relationship between IS and performance. To achieve the research objectives, the researcher administered questionnaires and conducted interviews to collect the data required to address the research objectives. The researcher has achieved all the research objectives as outlined mainly in Chapter 4. Specifically, section 4.2.2.4 revealed some of the IS implemented at TN, whereas, section 4.4 revealed some of the graphical presentations on the impact of IS on the various performance domains as perceived by the respondents. Similarly, section 4.5 highlights the hypothesis testing to statistically determine the relationship between IS and performance. Furthermore, the interview feedback as outlined in section 4.6 reveals a relationship between certain IS initiatives and performance. The researcher was able to relate IS impact to performance, both through qualitative data and statistically. Although, the majority of the findings were consistent with many studies, some were however not consistent with the majority of the studies.

5.4 Conclusions

The research found out that information systems were statistically significant in affecting performance at Telecom Namibia. Therefore, the research concludes that an information system is an important resource in influencing organisational performance in terms of user performance, financial performance, growth and learning, internal business processes, and customer satisfaction. Telecommunication companies should therefore, keep updating their information systems, train their staff, and improve their network connectivity to cope with the changing customer needs for better performance. The results of the research confirmed the results of previous studies showing that IS has an impact on organisational performance.

5.5 Recommendations

The research recommends that telecommunications organisations including TN should embrace information systems, in order to attain a competitive advantage and enhance service delivery to its customers, automate all critical processes to accomplish better efficiency, reliability and control in the organisation. The research also recommends that Telecom Namibia should do capacity planning; to build in-house capacity to handle information system policies and procedures that attempt to retain staff and develop alternative plans. The research also recommends that when organisations are introducing new information systems, aggressive campaigns through meetings and workshops should be encouraged to create employees' awareness on the importance of such systems for the day-to-day activities. The research further recommends that, organisations be encouraged to avoid the use of vendors' proprietary protocols, in order to promote interoperability and

use of commercial off the shelf products that make use of open standards and protocols, and use standards and service interfaces common with other clients where applicable. To facilitate the implementation of IS solutions to make a positive impact; the research recommends the framework outlined in Figure 5.1.

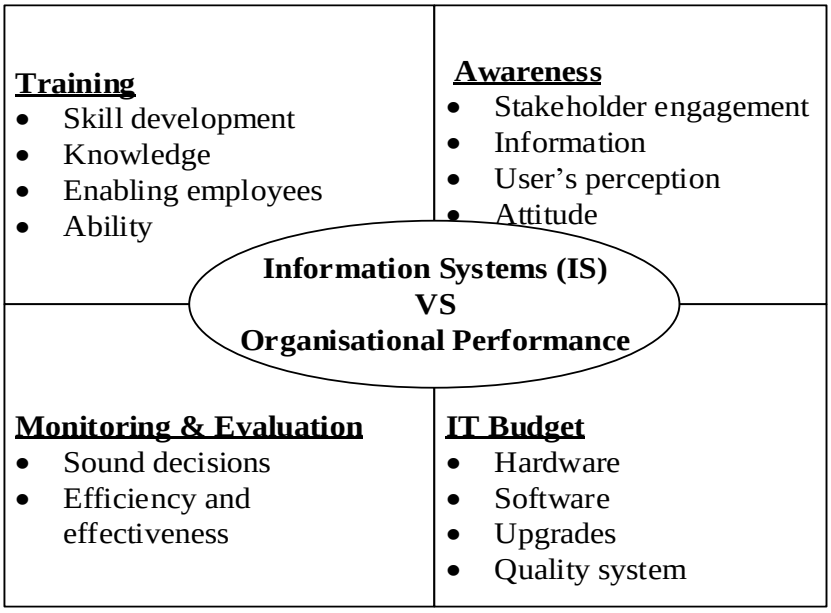

Figure 5.1: Recommended Framework for Telecom Namibia

Source: *Researcher's Construct*

The proposed IS vs organisational performance framework consists of four (4) main interrelated components: training, awareness, monitoring & evaluation, and IT budget as presented in Figure 5.1. Training equips employees with the relevant skills and knowledge to operate and administer the system. Awareness deals with engaging the right people and providing them with accurate information, to ensure that employees have a positive perception and attitude towards an IS. Monitoring and evaluation refers to the assessment of how efficient and effective a system is, and making sound decisions regarding the reality of the system. An Information Technology (IT), budget deals with

the availability of funds to cater for the required hardware and software, and the necessary upgrades to assure system quality. The interaction between these four components determines the performance outcome of an organisation making use of IS. This framework covers the critical issues that could lead to a comprehensive understanding of the relationship between IS and organisational performance.

The proposed framework considers the five domains of the IMBOK framework, for instance the required IS falls under the IT budget domain. The business processes and benefits of IMBOK are under awareness, and monitoring and evaluation components. Moreover, all the above makes it possible to meet the customer demands resulting in customer satisfaction and an increase in revenue.

5.6 Directions for future research

This research sought to assess the impact of information systems on organisational performance at TN in attempting to bridge the gap in knowledge that existed. This research focused on one organisation, thus there is a need to replicate the research using many other organisations in Namibia. Particularly, a comparative study in the SADC region either on a country-to-country basis, or between organisations from different SADC countries would add a lot of value and prove whether the findings of this study could be replicated to the region. Similarly, one may need to base future studies on larger samples of employees drawn from a broad range of organisations. Likewise, one may base future research on challenges facing information system usage by organisations in Namibia.

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APPENDIX 1: RESEARCH PERMISSION LETTER

NBS
NAMIBIA BUSINESS SCHOOL
UNIVERSITY OF NAMIBIA

07 November 2016

TO WHOM IT MAY CONCERN

Ms Letty Namwoonde of Student Number: 201310131 is registered for a Master in Business Administration – Management Strategy at the University of Namibia through the Namibia Business School.

This letter serves to inform you that her research proposal was reviewed and successfully met the University of Namibia requirements.

The student has been granted permission to carry out postgraduate studies research. The University of Namibia has approved the research to be carried out by the student for purposes of fulfilling the requirements of the degree being pursued.

If you have any queries please do not hesitate to contact the Business School at the University of Namibia.

Thank you so much in advance and many regards.

Yours sincerely

NAMIBIA BUSINESS SCHOOL NBS 07 -11- 2016 UNIVERSITY OF NAMIBIA Inspiring Minds & Shaping the Future

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APPENDIX 2: LETTER OF AUTHORISATION

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E-mail: oiva@telecom.na
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5th July 2018

TO WHOM IT MAY CONCERN

Sir/Madam,

LETTER OF AUTHORISATION TO CONDUCT RESEARCH

This letter serves as authorisation to Ms Letty Namwoonde to conduct the research project titled "Assessing the impact of Information Systems on organisational performance at Telecom Namibia" at our organisation, in fulfillment of her MBA dissertation requirement to obtain the qualification.

Upon a review of the request by the student, we are glad to offer her an opportunity to conduct the study in our organisation. All interviews, filed surveys, observations around the business and the distribution of questionnaires are approved and will be duly supervised by the researcher.

If you have any concerns or require additional information, feel free to contact our Department. Thank you

Yours faithfully,

OIVA ANGULA
HEAD: CORPORATE COMMUNICATIONS & PUBLIC RELATIONS

Directors: Ms Irene Simeon (Acting Chairperson), Ms Damoline Muruko, Ms Petro Oberholster, Mr Fernando Somaeb
Chief Executive Officer: Mr Theo Klein
Company Secretary: Ms Jinah Buys
Reg. No. 92/282

APPENDIX 3: QUESTIONNAIRE

PART I: General information:

1. **Please state your designation**
    a) Executive Management [ ]
    b) Senior Management [ ]
    c) Middle Management [ ]
    d) Subordinate [ ]

2. **In which of the following Business Unit do you belong?**
    a) Technical Operations & Projects [ ]
    b) Human Resources & Strategic Training [ ]
    c) Commercial [ ]
    d) TN Mobile [ ]
    e) Finance & Administration [ ]
    f) Internal Audit & Risk Management [ ]
    g) Corporate Communication & Public Relations [ ]
    h) Legal Services & Company Secretary [ ]

3. **How long have you been employed at Telecom Namibia (TN)?**
    a) Less than 5 Years [ ]
    b) 5 – 10 Years [ ]
    c) 11 – 15 Years [ ]
    d) 16 – 20 Years [ ]
    e) 20 Years and above [ ]

4. **Which system (s) are you using? (please check as appropriate)**
    a. Electronic mail [ ]
    b. Payment system [ ]
    c. Work Order Management System (WOMS) [ ]
    d. Network Management System (NMS) [ ]
    e. Element Management System (EMS) [ ]
    f. SAP system [ ]
    g. Call Centre system [ ]

h. Billing system [ ]

i. Other [ ] Please specify ----------

5. How often do you use an Information System?

a. Less than 4 times daily [ ]

b. 5 to 10 times daily [ ]

c. 11 to 20 times daily [ ]

d. More than 20 times daily [ ]

Part II. The Impact of an Information System (IS)

1. To what extent do you agree with the following statements regarding the use of IS at Telecom Namibia (TN) and how it affects your work? (Tick where appropriate).

	User's	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	**Don't Know**
1.1	Use of IS made it easier for you to do their job						
1.2	Use of IS has helped me with my decision making						
1.3	Use of IS gives me the confidence to accomplish my job						
1.4	Use of IS has improved the quality of my work						
1.5	Use of IS facilitates my learning						
1.6	Use of IS facilitates the transfer of knowledge between me and my colleagues						
1.7	Use of IS helped reduce my processing costs						
1.8	Use of IS helped save me time						
1.9	Overall, the use of IS positively affects my work						

2. To what extent do you agree with the following statements regarding the use of IS at TN and how it affects customers. (Tick where appropriate).

	Customers	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	**Don't know**
2.1	Use of IS has improved the delivery of goods and services that meet customer needs						
2.2	Use of IS has improved the delivery of customer goods & services according to specifications						

2.3	Use of IS has helped retain customers						
2.4	Use of IS has facilitated quality service delivery to TN customers						
2.5	Use of IS has facilitated better communication with its customers.						
2.6	Use of IS has facilitated better customer care						
2.7	Use of IS has helped reduce customer complaints						
2.8	Use of IS has improved planning and execution of project activities in reaching customers.						
2.9	Overall, use of IS affects TN customers positively						

3. To what extent do you agree with the following statements regarding the use of IS at TN and how it affects financial performance. (Tick where appropriate).

	Financial Performance	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	**Don't know**
3.1	Use of IS has improved company's productivity and consequently financial performance						
3.2	Use of IS has increased the company's income						
3.3	Use of IS has reduced production / service delivery costs						
3.4	Use of IS has reduced logistics costs						
3.5	Use of IS has increased gross profit						
3.6	Use of IS has helped TN monitor variance (budget versus actual) on real time basis.						
3.7	Overall, use of IS affects TN's financial performance positively						

4. To what extent do you agree with the following statements regarding the use of IS at TN and how it affects learning & growth. (Tick where appropriate).

	Learning & Growth	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	**Don't know**
4.1	Use of IS has facilitated better management of data needs in TN						
4.2	Use of IS has facilitated information sharing through the Supply Chain						
4.3	Use of IS has facilitated better knowledge management for the organisation.						
4.4	Use of IS has enhanced information sharing						

4.5	Use of IS enabled staff to deliberate on work activities and challenges regardless of their geographical locations.						
4.6	Use of IS has enabled experts based overseas to coach and support TN employees in tackling and resolving activities successfully.						
4.7	Use of IS has facilitated learning and knowledge transfer						
4.8	Use of IS has facilitated collective group discussion and collaborative problem solving						
4.9	Overall, use of IS has a positive effect on learning and growth in TN						

5. To what extent do you agree with the following statements regarding the use of IS at TN and how it affects internal business processes. (Tick where appropriate).

	Internal business processes	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	**Don't know**
5.1	Use of IS has made the decision-making process faster						
5.2	Use of IS has helped TN improve employee's productivity and increased flexibility						
5.3	Use of IS has facilitated information flow between departments in TN						
5.4	Use of IS has fostered cooperation between departments in TN						
5.5	Use of IS has enabled forecasting capability and innovation capacity						
5.6	Use of IS has helped TN implement target schedules on time						
5.7	Use of IS has significantly improved data collection and processing						
5.8	Use of IS has improved target monitoring and reporting significantly at TN						
5.9	Use of IS has improved operational efficiency of employees at TN						
5.10	Use of IS has improved the achievement of strategic goals						
5.11	Use of IS has led to more formalization of communication and procedures.						
5.12	Use of emails and social media has helped TN reach its customers and collaborate with its suppliers						
5.13	Use of IS has help speed up the delivery of products and services						

5.14	Overall, use of IS has a positive impact on TN's internal business processes						
5.15	Overall, use of IS has helped to make TN a more successful organisation						

6. **Kindly give suggestions of how else the use of information systems has improved service delivery at TN.**

---

7. **What are the barriers that hinders the adoption and effective use of Information Systems?**

Thank you for taking your time to participate in this survey

APPENDIX 4: INTERVIEW GUIDE

Topic: An assessment of the impact of Information Systems on organisational performance for Telecom Namibia

1. What is your position at Telecom Namibia?
2. Which Business Unit do you work in?
3. How long are you working for Telecom Namibia?
4. Which IS are used in your Business Unit?
5. Of all the IT systems and applications used in your Business Unit:

a) Which was most successful and why?

b) Which was least successful and why?

6. How has IS impacted performance in the Business Unit and Telecom in General?
7. What are the barriers that stand in the way of effective use of IT systems and applications in the Business Unit? Internal and external?
8. Are there strategies to measure IS impact for your business unit?
9. How is the Balanced Scorecard tool used to assess and evaluate corporate performance at Telecom Namibia?

Thank you for taking your time to complete this interview

APPENDIX 5: PLAGIARISM REPORT FROM TURNITIN

MBA thesis

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Dr.GM

The Rev. Dr. Greenfield Mwakipesile

ThD. MBA. HBS | mwakipg@outlook.com

CONTACT

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Ausspannplatz,
Windhoek,
Namibia

LANGUAGE & COPY-EDITING CERTIFICATE

5th October 2018

RE: LANGUAGE, COPYEDITING AND PROOFREADING OF LETTY N. NAMWOONDE's THESIS FOR THE MASTER OF BUSINESS ADMINISTRATION DEGREE OF THE NAMIBIA BUSINESS SCHOOL OF THE UNIVERSITY OF NAMIBIA

This certificate serves to confirm that I copyedited and proofread **LETTY N. NAMWOONDE's** Thesis for the **MASTER OF BUSINESS ADMINISTRATION DEGREE** entitled: **AN ASSESSMENT OF THE IMPACT OF INFORMATION SYSTEMS ON ORGANISATIONAL PERFORMANCE IN TELECOM NAMIBIA**

I declare that I professionally copyedited and proofread the thesis and removed mistakes and errors in spelling, grammar, and punctuation. In some cases, I improved sentence construction without changing the content provided by the student. I also removed some typographical errors from the thesis and formatted the thesis so that it complies with the University of Namibia's guidelines.

I am a trained language and copy editor and have edited many Postgraduate Diploma, Masters' Thesis, Dissertations and Doctoral Dissertations for students studying with universities in Namibia, Zimbabwe, Swaziland, South Africa and abroad. I have also copy-edited company documents for companies in the region and abroad.

Please feel free to contact me should the need arise.

Yours Sincerely,

The Rev. Dr. Greenfield Mwakipesile

greenfield.mwakipesile | @mwakipg | +264813901701 | Dr. Greenfield Mwakipesile