EFFECT OF BUSINESS INTELLIGENCE TECHNIQUES ON ORGANIZATIONAL PERFORMANCE: A SURVEY OF SELECTED COMMERCIAL BANKS IN SOUTH RIFT COUNTIES IN KENYA

WILLY BETT

A Thesis Submitted to the Board of Graduate Studies in Partial Fulfillment of the Requirements for the Conferment of the Degree of Master of Business Administration (Management Information Systems) of University of Kabianga.

UNIVERSITY OF KABIANGA

OCTOBER, 2019

DECLARATION AND APPROVAL

Declaration

This thesis is my original work and has not been presented for the conferment of a degree or for the award of a diploma in this or any other university:-

Signature _____ Date _____

Willy Bett

MBA/A/013/14.

Approval

This thesis has been submitted for examination with our approval as University supervisors:-

Signature……. Date ……

Dr. Williter Rop

Department of Marketing, Management Science, Tourism and Hospitality Management

University of Kabianga.

Signature…… Date…….

Dr. Patricia. C. Chepkwony

Department of Marketing, Management Science, Tourism and Hospitality Management

University of Kabianga.

COPY RIGHT

All rights reserved. No part of this thesis may be reproduced or transmitted in any form or by any electronic or mechanical means including, photocopying, recording or any information retrieval systems without prior written permission from the author or the University of Kabianga.

©Willy Bett, 2019

DEDICATION

I dedicate this thesis to my entire family. You have had invaluable input into this thesis.

ACKNOWLEDGEMENTS

I thank the Almighty God for giving me the knowledge, understanding, strength and the guidance to undertake this task. Secondly, this research thesis would not have been successful without the support from my supervisors, Dr. Williter Rop and Dr. Patricia Chepkwony. I thank them for their time, selfless guidance, wisdom and insight. Thirdly is to applaud my family and friends, who provided encouragement to soldier on and support in every way. Finally, I will always remain grateful to the entire University of Kabianga fraternity for providing a wonderful learning environment.

ABSTRACT

The major role of Business Intelligence Techniques in an enterprise is data resource utilization. Banks could create more value by leveraging on the data they have. However, greater portion of contemporary banks confront difficulties such as data underestimation, fragmented financial systems, small banks serving niche markets and are not contributing to competition in the sector, limited Outreach program of financial systems, fraud detection, mismanagement and even loss of business among others have remain glaring in the sector. Business data and data analysis process have necessitated the need for precise choices to be made and adoption of new tasks that enhances business performance. The general objective of the study was to establish the effects of Business Intelligence Techniques on organizational performance in Banking Sector in Kenya. The study sought to achieve the following objectives; to determine the effects of BI analytical techniques on organizational performance in banking sector, examine the level of effectiveness of BI measuring techniques on organization performance in banking sector, establish the contribution of Business Knowledge Discovery techniques on organizational performance in banking sector and to evaluate the influence of BI Reporting techniques on organizational performance in banking sector. The study adopted descriptive research design. The theories which guided the study were diffusion of innovation theory, theory of technology and technological acceptance model. The study was carried out in selected commercial banks in South Rift Regions specifically Bomet, Kericho and Narok counties. The target population of the study was 820 employees working in commercial banks in Bomet, Narok and Kericho Counties. 246 employees were sampled through random sampling of staff working in the bank and purposive sampling was used to select the managers. The response rate was 94.7% since out of the 246 questionnaires which were distributed 233 were returned having been fully filled. Questionnaires were the primary source of data which was collected from the sampled respondents through drop and pick method. The reliability test was done using Cronbach alpha and a value of 0.867 was actualized after the research instrument was pilot tested in commercial banks in Nakuru County; this indicated the research instrument was reliable. Validity of the instrument was achieved through construct validity where the instrument was subjected to scrutiny by the experts in the area of study. Data was analyzed using descriptive and inferential statistics and results presented by use of bar graphs, percentages, frequency distribution, pie charts and tables. The study establish that there was a strong significant relationship between business analytical ethnics and organizational performance ($r=0.953$, $P<0.01$), measuring techniques ($r = 0.946$, $p<0.01$), business knowledge discovery techniques ($r = 0.956$, $p<0.01$) and business reporting techniques ($r=0.926$, $p<0.01$). The value of R^2 which was 72.3% indicated that the dependent variable was explained by the variables included in the study. The study established that; banks need to use data mining tools for extracting information in a database; data visualization enabled easy comparison of the performance of bank.

TABLE OF CONTENTS

DECLARATION AND APPROVAL ..... **ii**
COPY RIGHT ..... **iii**
DEDICATION ..... **iv**
ACKNOWLEDGEMENTS ..... **v**
ABSTRACT ..... **vi**
TABLE OF CONTENTS ..... **vii**
LIST OF TABLES ..... **xi**
LIST OF FIGURES ..... **xii**
LIST OF ABBREVIATIONS AND ACRONYMS ..... **xiii**
DEFINITION OF TERMS ..... **xiv**
CHAPTER ONE **1**
INTRODUCTION **1**
1.1 Overview 1
1.2 Background to the Study 1
1.2.1 Organizational performance 4
1.2.2 Commercial banks 5
1.3 Statement of the problem 7
1.4 General Objective 8
1.5 Specific Objectives 8
1.6 Research Hypotheses 8
1.7 Justification for the study 9
1.8 Significance of the Study 10
1.9 Scope of the Study 11
1.10 Limitations of the Study 12
1.11 Assumptions of the study 12
CHAPTER TWO **13**
LITERATURE REVIEW **13**
2.1 Introduction 13
2.2 Review of Related Literature 13
2.2.1 Business analysis techniques and organizational performance 16

2.2.2 Influence of business intelligence measuring techniques on organizational performance 22
2.2.3 Influence of Business Knowledge Discovery Techniques on organizational performance 25
2.2.4 Influence of Strategic Reporting Infrastructure on Organization Performance 28
2.2.5 Challenges in the Application of Business Intelligence 31
2.3 Theoretical Framework 32
2.3.1 Diffusion of Innovations Theory 32
2.3.2 Theory of Technology-Organization-Environment Framework 35
2.3.3 Technology Acceptance Model 36
2.4 Conceptual Framework 38
2.5 Identification of Knowledge Gap 39
CHAPTER THREE 42
RESEARCH METHODOLOGY 42
3.1 Introduction 42
3.2 Research Design 42
3.3 Location of Study 43
3.4 Target Population 43
3.5 Sample Size and sampling procedures 44
3.6 Data Collection Instruments. 46
3.6.2 Validity 46
3.6.3 Reliability 47
3.7 Data Collection Procedures 48
3.8 Data Analysis and Presentation 48
3.9 Ethical Considerations 49
CHAPTER FOUR 50
RESULTS AND DISCUSSIONS 50
4.1 Introduction 50
4.2 Response Rate 50
4.3 Demographics Information of the Respondents 50
4.3.1 Respondents' Gender 50

4.3.2 Level of Education 51
4.3.3 Work Experience 52
4.3.4 Position Held 53
4.3.5 Age of Respondents 54
4.4 Effectiveness of Business intelligence Analysis Techniques on Organizational Performance 54
4.5 Influence of Business Intelligence Analysis Techniques on performance of Organization 58
4.6 Influence of Measuring Techniques on Organizational Performance 60
4.7 Effectiveness of Business Knowledge Discovery Techniques on organizational performance 66
4.8 Influence of Reporting Techniques on Organizational Performance 70
4.9 Inferential Statistics 74
4.9.1 Correlation Analysis 74
4.9.2 Multiple Regression Analyses 76
4.10 Testing of Research Hypotheses 79
4.11 Discussion of the Findings 80
CHAPTER FIVE 87
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS 87
5.1 Introduction 87
5.2 Summary 87
5.2.1 Effect of BI Analytical Techniques on Organization Performance 88
5.2.2 Level of Effectiveness of BI Measuring Techniques on Organization Performance 89
5.2.3 Effect of Business Knowledge Discovery Techniques on Organization performance 89
5.2.4 Effect of BI Reporting Techniques on Organizational Performance 90
5.3 Conclusions 91
5.3.1 Effect of BI Analytical Techniques on Organization Performance 91
5.3.2 Level of Effectiveness of BI Measuring Techniques on Organization Performance 91
5.3.3 Effect of Business Knowledge Discovery Techniques on Organization Performance 92

5.3.4 Effect of BI Reporting Techniques on Organizational Performance 92
5.4 Recommendations 92
5.5 Suggestions for Further Research 93
REFERENCES 94
APPENDICES 102
Appendix I:Questionnaire 102
Appendix III:Research License 109

LIST OF TABLES

Table 3.1 Target Population Of The Study 43

Table 3.2 Sample Size 45

Table 3.3 Reliability Test 47

Table 4.1 Gender of Respondents 51

Table 4.2 Level of Education 51

Table 4.3 Work Experience 52

Table 4.4 Job Position 53

Table 4.5 Ages of Respondents 54

Table 4.6 Business Intelligence Analysis Techniques and Organizational Performance 55

Table 4.7 Influence of Business Intelligence Analysis Techniques 58

Table 4.8 Influence of Business Intelligence Measuring Techniques 61

Table 4.9 Influence of Business intelligence measuring techniques 64

Table 4.10 Effectiveness of Business Knowledge Discovery Techniques 67

Table 4.11 Influence of Reporting Techniques on Organizational Performance 71

Table 4.12 Correlations 75

Table 4.13 Model Summary 76

Table 4.14 ANOVA[a] 77

Table 4.15 Coefficients[a] 78

Table 4.16 Summary of Test of Hypotheses 80

LIST OF FIGURES

Figure 2.1: Conceptual Framework of effect of business intelligence techniques on organizational performance. 38

LIST OF ABBREVIATIONS AND ACRONYMS

ATM	Automatic Teller Machine
BAT	Business Analytical Techniques
BA	Business Analysis
CBK	Central Bank of Kenya
BI	Business Intelligence
DOI	Diffusion of Innovations
ERP	Enterprise Resource Planning
ETL	Extraction, Transformation and Loading
ICT	Information Communication Technology
IS	Information Systems
IT	Information Technology
MIS	Management Information Systems
NCST	National Council for Science and Technology
OLAP	Online analytical processing
SME	Small and Medium Enterprises
TOE	Technology-Organization-Environment

DEFINITION OF TERMS

Business intelligence In this study, it referred to combination of products, technology and methods to organize key information that commercial banks need to improve profits and performance.

Intelligence As used in the study, intelligence referred to the facts and knowledge about the business environment and industry players

Technique As used in this study it referred to practical method, approach or a strategy applied to some particular tasks.

System This study is in agreement with the meaning as it deals with technological interrelated and interacting activities working together towards achieving organizational goals.

Organizational Performance In this study it referred to enterprise achievements of set goals and objectives. This can be in form of profitability, market performance or share index, and efficiency of an organization.

Analysis techniques in this study it referred to a procedure or a method for the analysis of some problems**,** status or a fact.

Measuring techniques The method or process used to get information portraying the elements of a procedure or the quality of the results of the process.

Knowledge discovery techniques Knowledge discovery is characterized as the non-trivial procedure of distinguishing legitimate, novel, possibly helpful and ultimately understandable patterns in data.

Reporting techniques It relates to information reporting which is the way toward gathering and submitting information which refers to precise examinations of the certainties on the ground revealing wrong information revealing can prompt endlessly erroneous decision-making due to mistaken proof. At the point when information isn't reported, the issue is known as under-reporting; the contrary issue prompts false positives.

CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter captures the background of the study, statement of the problem, general objectives, and Specific objectives, Research Questions, Significance of the Study, Limitations, Assumption and Scope of the Study.

1.2 Background to the Study

Information is one of the key assets of an organization. In every transaction of an enterprise, large amount of raw data are produced. Raw data processed into valuable information or knowledge provides an appropriate way an enterprise to access information for better and accurate decisions to be taken. This view states that tactical and strategic understanding is embedded in the gathering of a firm's data and mining actionable information will support an establishment to advance its commerce Loshin, (2003).

Many enterprises have made substantial investments in technology as well as innovation platforms that assist business processes and reinforce effects of functioning structure over decades. Majority are at a point where use of techniques to manage decision making process at strategic level shows up as more vital than any other time in recent memory. Such needs of organizations have denoted the requirement for Business Intelligence techniques (BI) that gives access to applicable data through serious utilization of data innovation Petrini, (2009). Business Intelligence is characterized as the blend of products, strategies and innovations to constitute important data necessary to enhance effectiveness and performance in organizations.

Principle role of Business Intelligence is to utilize data resources in terms of information and analyses of business within the setting of key business practices that necessitate specific choices and actions that brings about improved performance, Williams, (2006). BI techniques has the ability to boost utilization of data by exhibiting it in standard forms, coordinating and keeping it in a data warehouse making it open for extraction of valuable and shrouded data, along these lines expanding the precision of decision making and creating an upper hand that can likewise be called "competing on analytics" (Davenport, 2005). Contemporary banks in Serbia confront difficulties, for example, fierce rivalry, a high market dynamics, the need of strict control; fluctuating customer requests and risk administration are just a portion of the highlights of the business circumstances where present day banks conduct their activities.

Moreover, Curko Bach, and Radonic (2007) underlined that worries, for instance, suppression and identification of fraud, risk administration, customer management, loss avoidance and product administration, are a portion of the essential issues of financial organizations. According to Venter and Tustin, (2009), in South Africa, while a greater number of people understands how BI techniques function in organizations, it isn't promptly accessible, when they require it and in the configuration they require. Any great or little organization today should streamline its key decision process. With sharp increment in data collection because due to the developing global market and customization, decision making process should be quick and more precise. In spite of the fact that there has been a developing enthusiasm for BI area, successful accomplishment for executing BI is as yet sketchy Ang and Teo (2000).

In China, Lupu (2007) detailed that around 60% - 70% of business intelligence techniques flop because of the technology, organization, social and infrastructure issues.

In Romania, Moldovan, (2011) considered the financial industry and found that mining monetary information expresses a few difficulties, troubles and wellsprings of disarray, particularly while deciding on short term developments and approving them. An examination by Owusu and Liu, (2017) on research on the post-adoption impacts of BI techniques adoption on the hierarchical execution of Ghanaian banks uncovered that, for sure, BI techniques adoption absolutely affected the organizational performance of Ghanaian banks. Business Intelligence (BI) is one of the fundamental methods for dissecting information business processes and supporting basic decision process in ventures. It may be considered the latest stage in the improvement periods of Management Information Systems amid most recent decades.

Fundamental tasks of Business Intelligence Systems are integration, exploration, grouping, aggregation and a multidimensional examination of information beginning from different data assets, Olszak and Ziemba, (2007). To carry out these assignments, Business Intelligence frameworks utilize specific products, innovations and procedures that depend on a specific data framework foundation including methods, for instance, data warehouse and Enterprise Resource Planning (ERP) frameworks. A business intelligence technique captures the data gathered by a company, stores and transforms them into significant information that managers use in their everyday functions. It is helpful in depiction of data and provides a form of reality in open an open reports and analysis, so that better and convenient business choices can be taken in all operational, strategic and vital levels.

BI techniques should incorporate a viable data warehouse and furthermore, a receptive portion equipped for observing the basic operational procedures to enable strategic and operational managers to tune their roles in line with the organizational system, Matteo, Stefano, and Luris, (2004). The principle target of BI techniques is to give an in-depth examination of definite business information, including database and application advances, and also analysis activities. Keeping in mind the end goal to perform such inquiries, these techniques ought to have the ability of conceivably including information administration, enterprise resource planning, decision support systems and information mining, Gangadharan and Swamy, (2004). For handling crude information, BI techniques incorporate a few systems and programming for Extraction, Transformation and Loading (ETL), data warehousing, database query and reporting, multidimensional/on-line Analytical processing (OLAP) data analysis, data mining and visualization.

1.2.1 Organizational performance

Kanogo (2013) described organizational performance as a thorough analysis of its execution against its objectives and targets. It concentrates on the economic performance, market performance and share holder value of a company. Divenney, (2008) recommended that an organizations execution includes the organizations results; financial performance comprising of benefits, return on resources and return on investments, market performance, comprising of offers and market share and investor return. Some companies measure performance in view of how effective the company uses its assets to create benefit Mutuku, (2013). Further to that use of assets is likewise in view of the system picked by the association.

Mutuku, (2013) asserts that inside the idea of the Balanced Scorecard presented by Kaplan and Norton (1992) as a reason for vital administration framework, financial and non-financial parts of a firm were mixed with business technique at the time spent estimating the company's performance. There exist different methodologies where firms could change starting with one o the next in view of data demonstrating which one would enhance organization execution. Esfandiari and Rizvandi (2014), contend that strategy planning assumes a crucial part in e development of business organizations and that it is of basic significance to utilize long term plans to achieve organizational goals that guarantee better execution. Selection of a policy begins from obviously building up an organization's individual circumstance from recognizing openings and assessing its assets, considering that the organization can likewise embrace a mix of these techniques Puiu and Stanciu, (2008).

1.2.2 Commercial banks

The banking sector in Kenya is monitored by the Central Bank of Kenya (CBK) presently constituted under Article 231 of the constitution 2010. The CBK has the obligation of framing monetary policy, upholding price stability, issuing currencies and different capacities as expressed by a demonstration of parliament. Beck and Fuchs (2004) expressed that regionally, Kenyan financial framework is generally all around created and broadened, a laud it appreciates right up 'til the present time, and that it appreciates larger amounts of credit channeled to the private segment and higher deposits in money related establishments when contrasted with other sub-Saharan nations. Beck, (2010) expressed that the Kenyan financial system is the biggest and mostly developed in Eastern parts of Africa and that its steadiness has multiplied in the recent time.

Nevertheless, many challenges endure, the banking system is still fragmented, small banks serving niche markets and now not contributing to competition in the area and outreach of the financial apparatus nevertheless confined. The Kenyan financial outlook has of late witnessed the progress like M-PESA and mobile cash by and large, seen as being corresponding to the arrangement of financial facilities offered by extensive financial organizations, Allen, (2013). Indiatsy (2014) inferred that there has been developing rivalry from worldwide and also local banks and would require basic investigation of the focused powers in the business. This rivalry is ascribed to an expansion in take-up of client record of loan repayment and endorsements to begin agency banking and entrance of global banks into the Kenyan market.

Mulatya, (2012) found that significant African banks, for example, Eco-Bank has branches in more African nations, including Kenya, than some other bank, CFC-Stanbic Bank is one of the biggest banks in Africa to have for quite a while worked in other African nations. Muthoni, (2012) recommended that present techniques utilized by banks are cost and product differentiation, development, innovation and mergers. Moreover, increment in rivalry has come about because of developments, for example, e-banking, utilization of Automatic Teller Machines (ATMs), adjustment of products and new participants into the Kenyan Market. She featured the key issues confronting banks in Kenya as changes in administrative and money related structure, increment sought after for non-conventional administrations, decrease in premium edges and an accentuation on client benefit as opposed to the product.

Buluma, (2012) kept up that in the recent past there have been various vital moves by banks in Kenya, for example, rebranding, mergers, takeovers, increment in banking hours, and a recharged center around the lower end of the market. Utilization of ICT has additionally upgraded productivity and expanded conveyance channels with products, for example, e-banking; m-banking that has lessened the dependability of money as the principle methods for settling installments. As indicated by Mbaluka, (2013) the estimation of data is generally thought little of by numerous banks in Kenya maybe because of absence of time, resources and understanding. She calls attention that banks could make more an incentive by utilizing on the information they have, yet this isn't occurring on a huge scale. Be that as it may, this is changing because of improvements in various fields, both mechanical and non-innovative. This suggests banks in Kenya are continuously holding onto business knowledge in order to use on the information they have and make more esteem

1.3 Statement of the problem

The major role of Business Intelligence Techniques in an enterprise is data resource utilization. Business data and data analysis process have necessitated the need for precise choices to be made and adoption of new tasks that enhances business performance. Empirical studies reveals that, numerous enterprises have put up critical investments on innovations that helps business processes and fortify productivity in operational structure. Banks could create more value by leveraging on the data they have. However, greater portion of contemporary banks confront difficulties such as data underestimation, fragmented financial systems, small banks serving niche markets and are not contributing to competition in the sector, limited Outreach program of financial systems, fraud

detection, mismanagement and even loss of business among others have remained glaring in the sector. Therefore, this study sought to evaluate the effectiveness of BI techniques on the firms' performance.

1.4 General Objective

The general objective of the study was to establish the effects of Business Intelligence Techniques on organizational performance in Banking Sector in Kenya.

1.5 Specific Objectives

The following specific objectives guided the study;

i. To determine the effect of Business Intelligence analytical techniques on organizational performance in banking sector in South Rift Counties in Kenya
ii. To examine the level of effectiveness of Business Intelligence measuring techniques on organizational performance in banking sector in South Rift Counties in Kenya.
iii. To establish the effect of Business Knowledge Discovery techniques on organizational performance in banking sector in South Rift Counties in Kenya.
iv. To evaluate the effect of Business Intelligence Reporting techniques on organizational performance in banking sector in South Rift Counties in Kenya.

1.6 Research Hypotheses

The following research questions guided the study;

i. H_{01} There is no significant effect of Business Intelligence analytical techniques on organizational performance in banking sector in South Rift Counties in Kenya
ii. H_{02} There is significant effect of Business Intelligence measuring techniques on organizational performance in banking sector in South Rift Counties in Kenya.

iii. H_{03} There is no significant effect of Business Knowledge Discovery techniques on organizational performance in banking sector in South Rift Counties in Kenya.

iv. H_{04} There is no significant effect of Business Intelligence Reporting techniques on organizational performance in banking sector in South Rift Counties in Kenya.

1.7 Justification for the study

Business Intelligence allows companies to make informed business decisions which can be the wellspring of competitiveness. It is evidently seen when companies extrapolate data from pointers in the outer environmental conditions and make exact estimates on future patterns or economic conditions. When business facts are accumulated viably and utilized well, informed choices that are beneficial to the organizations can be made. The major aim of business intelligence techniques is to enhance auspiciousness and improve the quality of data. Convenient quality data is like having a crystal ball determining the best course of action to take.

Business intelligence uncovers a firm's situation as in contrast with rivals, customer behavior change and spending styles, the strength of the firm, financial circumstances, trends, demographics, monetary data and social, administration, and political condition. In today's fast moving world buyers are requesting for more effective and productive administration services in organizations. To stay focused and competitive, companies should meet or exceed customer's desires. Organizations must depend intensively on business intelligence techniques to remain in front in all manner of works. Users of Business Intelligence have started requesting instant Business Intelligence techniques or close to real time analysis associated with the business, specifically in forefront activities.

They will expect generally progressive and new information in a clear manner just as they display stocks statements on the internet. Monthly and even weekly analysis cannot surface. In few years to come, organizations will be dependent on the real time business information just like people getting information from the internet in a click of the mouse. Additionally business information will turn to be more democratized where users in all sections in a company will have the ability to view and access information on their particular sections to see how it's performing. Along these lines, later on, the capacity necessities of business intelligence will increase similarly to buyer desires. It is in this way basic that organizations should increment at a similar pace or considerably quicker to remain focused.

1.8 Significance of the Study

Business Intelligence gives many advantages to companies which uses it. It can take out a great deal of the riddle inside an organization, redesign communication among workplaces while coordinating and organizing activities, and empowering organizations to respond rapidly to changes in economic conditions, client inclinations, and supply network tasks. Business Intelligence improves the general performance of the enterprise using it. Data is frequently viewed as the second most critical asset organization has since an organization's most important resources are its human work force. An organizational settles on choices in light of auspicious and precise data, which enhances its execution. Manager of the banks may use Business Intelligence in decision making, as acting rapidly and accurately on data before competitors do, can consequently bring about aggressive and unrivaled performance. Clients may benefit through enhance client experience, taking into account the opportune and suitable reaction to client issues and needs.

With the assistance of BI techniques, workers without much stretch can convert over their business knowledge through the systematic knowledge analytical to comprehend numerous business issues, for instance enhancing response rates from regular postal mail, phone, email, and Internet conveyed advertising efforts. Workers can differentiate the most beneficial clients and the major purposes behind their devotion to the company, moreover, recognize future potential clients with equivalent potential, investigate potential development of client productivity and decrease risk introduction through more exact financial credit scoring of their clients. It figures out what blends of goods and service lines clients are probably going to buy and when, examine clinical preliminaries for exploratory medications, and set more productive rates for protection premiums. Business Intelligence techniques additionally decides with steady loss and agitate examination why clients leave for competitors as well as turning to be the clients, and to recognize and discourage fraudulent conduct, for instance, from utilization spikes when a credit or telephone cards are stolen and Identify promising new sub-atomic medication mixes.

1.9 Scope of the Study

The scope of the study was to determine the effect of Business Intelligence Techniques on Organizational Performance in Banking Sector. The study variables were business intelligence analytical techniques, business intelligence measuring techniques, business knowledge discovery techniques and business intelligence reporting techniques.

The target population for the study comprised of employees drawn from commercial banks in south rift region specifically Bomet, Narok and Kericho Counties which were 820 in number, out of which a sample size of 246 was drawn. The study covered the period between May to July 2019.

1.10 Limitations of the Study

The following limitations influenced the outcome of the research findings; some respondents were not co-operative enough in filling the questionnaires and some feared being victimized for divulging sensitive information; this was mitigated by assuring the respondents that the information they gave was purely for academic purpose. Misinterpretation of questionnaires content could have easily compromised the outcome of the research but was mitigated by elaborating to the respondents when they had difficulty in answering a given question. The researcher maintained confidentiality, clarified question items in the instrument and elucidated to the respondents as a way of giving adequate information before they choose to partake the study.

1.11 Assumptions of the study

It was assumed that the survey instrument developed by the researcher permitted the assessment of banking institutions on the effects of Business Intelligence Techniques on Organizational Performance. It was also assumed that all respondents cooperated and gave actual opinion on aspects related to the area of study

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses the influences of Business Intelligence on organizational performance in banking sector. Key areas of concern included; Theoretical framework, review of related literature, knowledge gap and conceptual framework.

2.2 Review of Related Literature

Ranjan (2008) understood that understanding data and molding it into valuable information is a key methodology for any organization to increase competitive advantage and that a win factor for organization is discovering methods for incorporating the huge measures of information produced from business processes and comprehending them. Further, with the development of company intranets, extranets and the internet has created a favorable environment for rapid development of internet banking to take root in developing countries according to Nazir, (2011). Internet banking can enhance the institution's strategic initiatives and simultaneously empower customers, they state further. Internet banking offers a means for banks to collect data from the transactions made by customers such as types of transactions, frequency, currency used. This offers an opportunity for the banks to carry out analysis on the data and come up with products that complement customer habits. A major driver for Business Intelligence is that firms already have systems that collect data however end up in situations with no techniques to put this data and information to use for strategic decision making (Ranjan, 2008).

Operation transactions captured by banks over time tend to be vast. These firms are then faced with the idea that they could use these vast amounts of data to leverage their competitive advantage and this has been made increasingly possible by the fast advancement in computer and associated technologies. Availability of large integrated databases and development of powerful techniques of visualization and data analysis has generated interest in business analytics for improvement of decision making hence better organizational performance and enhanced competitive advantage Sharma, (2010). Additional advancements in ICTs have greatly impacted their application and consequently how organizations do business. Recent improvements in business analytics including new technologies, system integration and user interface design have been driven by business value, and to increase these analytics are increasingly getting embedded into larger systems and processing together with other matters specific to analytics are increasingly considered into overall system design Kohavi, (2002).

Several empirical studies over the past decade investigating the correlation between IT investments and firm performance have failed to find a strong correlation as said by Masa'deh (2008). One of the directions of research for Business Intelligence is on the requirements for a successful implementation. A study by Tan (2011) suggested that management of a successful BA initiative depends on a series of four main dimensions in the following order; information quality, master data management, warehousing architecture and analytics, all working together and each maturity level is a requirement to the next level. Getting of these factors right and in the order prescribed may prove challenging to banks.

Decision path Consulting (2010) identified finance, operations and sales and marketing as the business areas that offer the biggest challenges to application of Business Intelligence.

Business enterprises are faced with the challenge of identifying the components that construct business intelligence within the firm, the task is to be able to identify within the business domain what information the business needs to know for successful implementation of BA Green, (2007). Ranjan, (2008) observed that organizations need to make sure that appropriate security and privacy controls are put in place in the implementation of BI projects in reference to the challenge of potential sensitivity of data involved. Xia and Gong (2012) said that there is a high cost of implementing BI technologies financially challenging small and medium sized companies especially, with additional costs accruing from hardware standards and business transactions. They further said that IT technologies involve complicated setups and related data mining techniques which require technical expertise to manage, and that companies that do not use BI technologies think that BI is not essential to their daily operations.

Trkman, (2010) established that the success of IT investments in BI is not self-assured, the main challenge being how to best utilize the data provided by the software. Organizations that already have systems in place to collect data and gather information often do not have suitable approaches to put the information to use for strategic decision making. In the light of the above contentions, banks are forced to embrace BI as measuring techniques to enhance their performance.

Banks in the south rift region need to address challenges experienced as a result of lack of these measuring techniques hence the study on Effect of Business Intelligence Techniques on Organizational Performance with special focus on commercial banks in selected counties in south rift region in Kenya.

2.2.1 Business analysis techniques and organizational performance

As indicated by Sharma (2010) BA is the collection, storing, statistical examination and apprehension of a lot of organizational information with the point of settling on better decisions and enhancing organizational performance and increasing competitive edge. BI has been used as an umbrella term to portray ideas and techniques to help enhanced basic leadership by utilizing factual based supportive systems, while business intelligence and Analysis (BIA), in 1989, has made progress in IT and scholars in the recent past and it alludes to the technologies, frameworks, practices and applications that analyses business information that the firm better comprehends its business, as proposed by Lim (2012).

As the BI idea wound up famous in the 1990s, BA was acquainted to mirror the analytical segment in BI. Chen , (2012) offering ascend to the adoption of the term BI.BI could be seen as a framework that recognizes difficulties and openings in information utilizing analytical techniques with a standout among the most widely recognized utilization of BA being planning and forecasting (Xia & Gong, 2014).Information to be analyzed has been incorporated into one database or data warehouse from various operational databases, where analysis is effected utilizing procedures, for example, data mining, visualization, online analytical processing (OLAP), statistical examination and prescient models.

Information from different diverse sources is coordinated into a comprehensible body for upgraded strategic planning and decision support, conveyed at the ideal time, right area and in the correct form, bringing about enhanced decisions (Tan, 2011).

A number of researchers have recorded uses of business analytics that can add to organizational performance, for example, in promotions that can diminish client wearing down and enhance client benefit, enhance value of internet business, additionally production and manufacturing, sales and forecast, production designs, in finance, human asset and innovative work as observed by Sharma (2010).Organizational benefit and performance is at the center of firms and BA guarantees this, as Ranjan (2008) recommended that the desire for actualizing more brilliant business forms is the place where business intelligence impacts the execution of firms. All organizations want to pick up advantage over their rivals and are set up to embrace BA if seen to offer the preferred standpoint they require.

Furthermore changes in ICT has driven information examination technologies to utilize parallel figuring ways to deal with impediments of existing database frameworks to enhance through input, as indicated by Tambe (2014), and that the expansion in rate and size of data accumulation has raised the value of development in information handling innovations. Numerous difficulties to business analytics have been proposed by scholars and specialists alike however for Rseehuus and Ervik (2012) the four primary difficulties looked by organizations are strategic alignment, agility in the organization, commitment to BA execution and information maturity.

Business analytics is seen by Xia and Gong (2012) as having advantages, for example, encouraging quicker and more precise reporting, and enhanced decision making, enhanced client services and expanded income. As per studies embraced by Ranjan (2008), Business analysis device is said to give basic understanding in empowering organizations to settle on the right and auspicious choices and encourages the investigation of different parts of business tasks to raise new income or save money on costs by expanding rate of return and supporting information decisions. Research studies have portrayed various utilization of business analysis techniques procedures and how they could enhance execution and upper hand. Nonetheless, an obviously explained theoretical grounded model of the components and procedures essential in ascertaining performance picks up from business analytics has been subtle as seen by Sharma (2010). Knowledge of the elements and prerequisites important for business analysis applications could empower organizations exploit the new facts and apply it to their vital strategic decisions making, along these lines responding faster to factors confronting the said business.

Sharma (2010) watched that past studies on business analytics had speculations on how it may add to upper hand nevertheless; a clear theoretical based model of the components associated with realizing the potential performance benefits is yet to be presented. Njuguna (2013) in his study uncovered that execution of business knowledge dashboard by Kenya Power has effectively enhanced their decision making process. Notwithstanding, Otieno (2010) in his examination discovered that difficulties looked by banks in adoption of utilization of ICT included resistance to change, security dangers, high introductory costs, cost of maintaining ICT improvements, fraud, expenses on

software, high expenses of training staff, changing to new financial systems and so on. These difficulties would then definitely influence the usage of BA in the commercial banks.

Mbaluka, (2013) in his studies revealed that Kenyan banking sector is starting to put out plans on where enormous data could convey the most value however, numerous financial firms are careful about making these investments in a move towards business analysis. As firms go to the acknowledgment of the possibility of better decision making and expanded client esteem, they are progressively embracing business systems in their tasks which enables business officials' proactive capacities to foresee, estimate, evade, do correction and control circumstances in their organizations (Business Week Research Services, 2009). The contributions of business analytics to an enterprise performance isn't completely appreciated as it is quite new idea in Kenya, suggesting an absence of appropriate comprehension of its tasks and the principle objective of its application.

A noteworthy objective of BA is to automate and incorporate however many advances and capacities as would be prudent and besides to give information for analysis that are as instrument autonomous as could be allowed (Biere, 2003). This sets the phase for use of business analysis methods in banking sector in south rift locale to access data that could be utilized to improve decisions and in an opportune way. This is relied upon to enhance the execution of the organization in the levels of operations that is corporate, business and functional levels, and furthermore to enhance its upper hand.

BA is an expansive scope of scientific systems and software answers for gathering, combining, examining and giving access to data for endeavors that they may settle on better informed choices (Ranjan 2008).

Investigation has certainly discovered advances into organizations, for example, banks, media transmission organizations, retail outlets. More so marketing offices where there is a powerful urge to reach the correct individuals at the right place and at the ideal time with the correct offers. All marketing promotions analysis has dug in itself solidly in helping organizations to understand more about their clients, areas of opportunities, building brand dependability and averting wearing down.

Mbaluk (2013) discovered five key business zones that present generally safe open doors for quantifiable execution of utilizing enormous information which were; target marketing, customer service, intelligent forecasting, client profiling, customer detection and fraud identification. Furthermore, Trkman (2010) implied that BA has been distinguished as a critical instrument in production network administration. Shung and Junyu (2012) say that analytics have discovered their way into customer industry, in most cases banks and telecoms, all the more particularly in marketing helping organizations to comprehend their clients, territories of opportunities and building unwavering brand. Likewise they propelled regions of use of BA in organizations; they separated them into inward and outside components. Outside elements depended on Porter's five forces that is competitors, suppliers, customers and substitute products. The interior elements were procedures and activities, HR administration topped with help from top management. Decision path consulting (2010) discovered three major territories of tasks that BA is applied but with difficulties, these are in finance, sales and marketing and in operations.

Njuguna (2013) uncovered that execution of business knowledge dashboard by Kenya Power, have effectively enhanced their decision making process. Factor for organizations is finding ways of integrating the vast amounts of data generated from business processes and making sense of them.

Further with the development of company intranets, extranets and the internet has created a favorable environment for rapid development of internet banking to take root in developing countries according to Nazir (2011). Made by clients, for example, transaction types, recurrence, funds utilization and so forth. This offers Internet bank can improve the institutions key activities while empowering clients, they state further. E-banking offers methods for banks to gather information from the transactions, an open door for the banks to complete examination on the information and generate products that supplement client propensities. A noteworthy driver for BI as per Ranjan (2008) is that organizations as of now have frameworks that gather information however, wind up in circumstances without any strategies to put this information and data to use for key decision making. Operational activities caught by banks over a period of time have a tendency to be immense.

These organizations are then faced with the possibility that they could utilize these huge measures of information to use their upper hand and this has been made progressively conceivable by the quick advancement in computer development and related advances. Accessibility of substantial incorporated databases and advancement of intense strategies of visualization and information examination has produced enthusiasm for business analysis for development of decision making, thus better organizational performance and improved competitive advantage (Sharma, 2010).

Extra progressions in ICTs have extraordinarily affected their application and thus how organizations work together. Late upgrades in business analytics including new advances in technology, system integration and User Interface configuration have been driven by business values, and to expand this analytics are progressively getting installed into bigger systems, accordingly, information accumulation, storage and processing together with different issues particular to analytics are progressively considered into general systems plan (Kohavi, 2002). Making reference to the Strategy Alignment Model (SAM) of Henderson and Venkatraman (1989) Masa'deh (2008) induced that IT-business arrangement is achievable by building linkages among four key areas, that is business strategy, IT technique, organizational foundation and procedures and IT framework and procedures.

2.2.2 Influence of business intelligence measuring techniques on organizational performance

Balanced Scorecard is a performance administration apparatus. It started as an idea for estimating whether the smaller-scale operational exercises of an organization are aligned with its bigger scale targets as far as vision and procedure.

Companies were urged to quantify, notwithstanding financial yields, those components which affected the financial yields. The basic reason is that companies can't straightforwardly impact financial results, as these seem to be 'relaxed' measures, and that the utilization of financial measures alone to illuminate the vital control of the firm is imprudent. Organizations ought to rather additionally measure those areas where management intervention is easier.

In this manner, the early forms of the Balanced Scorecard helped firms accomplish a level of "balance" in choice of performance measures. By and by, early Scorecards accomplished this balance by urging management to choose measures from three extra classifications or viewpoints: Customer, Internal Business Processes, and Learning and Growth. Understanding Business Intelligence requires, above all, a comprehension of the balance scorecard as a performance management strategy. Business Intelligence is an instrument for inspecting methodology and overseeing execution. Expressed in other words, the reason for the scorecard is to adjust vision and mission to client requirements and everyday work (Howard Rohm).Scorecards likewise enable organizations to oversee and assess methodology. It achieves this by connecting key topics and goals to measures of operational perfection.

As per studies did by Senge (1990), Kotter (1995), to settle on objective decisions about organizational action and not minimum set focuses for those exercises, a firm ought to build up a clear thought regarding what the organization is endeavoring to accomplish. This is in consent to perceptions made by Olve (1999) and Shulver (2000) that a destination statement portrays, preferably in some detail, what the organization is probably going to look like at a concurred future date.

Much of the time this activity builds on existing plans and records - yet once in a while practically it is rare to discover a pre-existing report that offers the important lucidity and assurance to completely fill this need inside an organization. The destination statement offers a clear and shared image of an organization sooner or later; however it doesn't give an appropriate concentration to management consideration between now and then.

What should be done and accomplished in the medium term for the organization to "achieve" its goal on time is settled upon as targets or priorities. Senge (1990) and Senge (1999) revealed that, by representing the chosen targets or objectives on a "strategic linkage model", the designer group is urged to apply "systems thinking" to identify circumstances and end results connections between the chosen goals what we have to do to accomplish the outcomes we anticipate. This approach likewise guarantees the objectives picked are equally supportive and represent the collective thinking of the team's high-level view of the business model.

The chosen strategic goals are spread throughout four zones or 'perspectives'. The lower two views include targets pertaining to the most essential activities in terms of commercial enterprise processes, cycle time, productive (Internal Processes) and what wishes to occur for these approaches to be sustained and in addition developed in terms of people, product and method improvement (Learning and Growth).The top two perspective house objective pertaining to the coveted consequences of the actions undertaken, how we wish external partners (the public, partner agencies and organizations to see us (External Relations) and how this will eventually convert into monetary outcomes and financial value (Financial)

When objectives have been identified, measures can be adopted and built with the expectation to assist administration's capacity to monitor the company's progress towards accomplishment of its objectives as were progressed by Olve (1999). Niven (2002) likewise implied in his study that initiatives are extraordinary tasks with a restricted beginning and ending date and are mapped to strategic objectives to give a sign of the undertakings or activities required keeping in mind the end goals to be achieved.

The above business intelligence measuring techniques have impact on organizational performance in banking sector if the same are actualized as expected by banks. Banks needs to realign these measuring techniques to their business methodology with the goal for them to plot their organizational performance.

2.2.3 Influence of Business Knowledge Discovery Techniques on organizational performance

Data mining systems have been produced for investigation and analysis of substantial amounts of information to discover important facts and principles via programmed or semi-automatic means. In Business Intelligence setting, Data mining is utilized for finding and extracting significant knowledge in corporate data warehouses that can boost business decision making. It is a corresponding device to other data analysis techniques, for example, statistics, OLAP, spreadsheets, and fundamental information access. Data mining determines patterns and relations concealed in data, and it's thought-about to be the core stage of Knowledge Discovery in Databases. Fayyad and Piatetsky-Shapiro and Smyth, (1996), noted that knowledge Discovery in Databases is the whole procedure of utilizing database alongside any needed choice, preprocessing, sub-sampling, selecting the right method for information transformation or illustration.

While exercising data mining software, it is nonetheless important to understand the business, apprehend the data, or be conscious of normal statistical methods. Moreover, the information found by means of data mining need to nevertheless be verified, therefore it helps enterprise analysts to generate hypotheses, however it does not validate the hypotheses as postulated by Rygielski, Wang and Yen, (2002) in their studies.

Chien and Chen, (2008:281) in their studies undertaken, discovered that Data mining entails a variety of methods such as statistics, neural networks, decision trees, genetic algorithms, and records visualization to cope with huge portions of data. They continued to elude that Data mining outputs are typically classified as association, clustering, classification, and prediction. Association is the discovery of affiliation guidelines displaying attribute-value conditions that take place frequently collectively in a given dataset.

Clustering is the procedure of dividing a dataset into various clusters in which the intra-class similarity is maximized while the inter-class similarity is minimized. Classification derives a function or mannequin that identifies the categorical classification of an object based totally on its attributes. Prediction is a model that predicts a continuous value or future statistics trends. This subject has been notably studied and mentioned in literature.

Davenport (2010) mirrored that BI systems are a very essential element of the new information infrastructures because they make a contribution for both, success and efficiency. These are generally used by managers whilst introducing new techniques to manage businesses in a better and more focused way. This was once in agreement to the findings of Wixom and Watson, (2010) in their studies. The function of BI systems and their effects over corporations has been a problem that changes constantly.

From basic, static investigative frameworks they have formed into arrangements that can be utilized as a part of key planning, customer relationship management, checking tasks and to contemplate the benefit of products. This is reflected by ponders embraced by Negash and Gray, (2008) in their discoveries.

They are another way to manage an organization and another method for gathering, storing, preparing, examining, and utilizing data as fortified by (Williams and Williams, 2007) in their examination discoveries. The BI expression is often used to depict the innovations, applications, and procedures for gathering, storing, getting to and investigating information to assist clients with making better choices as characterized by Davenport. Wixom and Watson, (2010) in their investigation discoveries. These frameworks allude to making choices, data examination and knowledge administration.

As indicated by Azvine (2006), BI is about the catch, access, understanding and the examination of crude data into information/knowledge so as to enhance business. Wells in his investigations (2003) perceives BI as the ability of an enterprise to clarify, design, anticipate and tackle issues, think abstractly, comprehend, invent, and learn with the goal that organizational information can increase, give data for decision making process, empower successful activities, and support building up and accomplishing business objectives. On a very basic level, BI intends to access right data at the right time, so as to settle on the correct choice. Understanding the information that is produced during day to day business operation of an organization assumes a noteworthy part of the business methodology for making competitive SMEs.

This need turned out to be more reasonable with the multifaceted nature felt in the present business condition. All organizations, not simply SMEs, should be nimble and proactive in response to the market. They have to settle on choices more rapidly and for this issue it is important to comprehend the data and to track the historical backdrop of future occasions that may happen. This factor is what drives companies to acquire Business Knowledge Discovery Techniques.

Commercial banks in south Rift should live to the assignment to grasp Business Knowledge Discovery Techniques with a specific end goal to enhance organizational performance.

2.2.4 Influence of Strategic Reporting Infrastructure on Organization Performance

Reporting exercises build up a foundation particularly for strategic reporting to serve the key decision-making component of a business. These exercises include techniques, for example, data visualization and OLAP. Collaboration exercises give distinctive parties to cooperate through information sharing and Electronic Data Interchange. Such a foundation would take into consideration constant circulation of measurements through email, messaging systems as well as interactive displays. Information Management exercises to make business information driven through procedures and practices to identify, make, represent, disseminate and enhance adoption of experiences that are genuine business knowledge. The crucial usefulness of Business Intelligence techniques can be condensed as storing, integrating, coordinating and organizing data; querying and reporting information; and knowledge extraction.

Business Intelligence techniques most cases offer a coordinated and integrated arrangement of systems, technologies and software products that are utilized to incorporate heterogenic data from circulated sources and break down the incorporated data with the goal that extricated knowledge can regularly be utilized. BI undertakings utilize a mix of the technological structure of the BI frameworks as projected by Olszak and Ziemba, (2007) in their examinations. It can just be characterized as automatic investigation of data warehouse or data mart data to yield significant business knowledge.

OLAP gives multidimensional, summarized perspectives of business information and is utilized for modeling, reporting, planning and analysis for upgrading the business. OLAP methods can be utilized to work with data warehouses or data marts intended for modern enterprise intelligence systems. These frameworks procedure queries are required to find inclines and investigate critical components. Reporting software produces aggregated views of data to keep the administration aware about the condition of their business. Studies did by Ranjan,(2009) revealed that there are other BI techniques which are utilized to store and dissect information, for example, data mining and data warehouse; decision support systems and forecasting; document ware house and record management; knowledge management; mapping, knowledge management, data visualization and dash boarding; management information systems. Data warehouse is a focal store of data that can be examined to settle on better decisions. Data streams into a data warehouse from transaction frameworks, relational databases, and different sources, commonly on a regular rhythm. Business investigators, information researchers, and decision makers get to the information through business intelligence (BI) techniques, SQL customers, and different analytics applications.

A data warehouse is just a single, complete, and steady store of data got from a various sources, improved for dissemination and influenced accessible to end users in a manner they too can comprehend and utilize it in a business setting. It gathers and stores incorporated arrangements of historical data from various operational frameworks and feeds them to one or more data marts. A data warehouse reinforces the physical spread of information by taking care of the various enterprise records for integration, purifying, accumulation and inquiry undertakings.

It can likewise contain the operational information which can be characterized as an updateable arrangement of incorporated information utilized for business wide strategic decision-making of a specific subject area. It contains live information, not depictions, and holds insignificant history. Data sources can be operational databases, historical information, and external data for instance, from market surveying organizations or from the web, or information from the existing data warehouse environment.

Ranjan, (2009) discovered that information sources can be relational databases or some other information structure that backs the line of business applications. They can also dwell on a wide range of platforms and can contain organized information, for example, tables or spreadsheets, or unstructured data, for example, plaintext files or pictures and other multimedia information. Data Marts are envisioned to encourage end-user data analysis. It actually support a single, analytical application utilized by a section or a unit in a business. A data mart as portrayed by Inmon, (1999) in his studies is a gathering of subject area of knowledge sorted out for decision support in light of the requirements of a given department. It can reinforce a specific business function, business process or specific unit.

The data mart of every office is particular to its own particular needs and is enhanced to access it. The data mart of a particular division in an enterprise is simply somewhat resembles the data mart of another office or a department. According to the views of Inmon, (1999) individual divisions possess the hardware, software programs and data that constitute the data mart. Like data warehouses, data marts contain operational information that assists business specialists to strategize in light of examinations of past patterns and encounters.

The key distinction is that the formation of a data mart is predicated on a particular, predefined requirement for a specific gathering and arrangement of selected information.

2.2.5 Challenges in the Application of Business Intelligence

A directing variable to achievement of a BI activity is IT and organization strategic arrangement. Research works on the relationship between IT investments and firm performance have not at all located a solid connection as eluded by Masa'deh (2008). One of the desiring researches for BI is on the prerequisites for a fruitful execution. An examination by Tan, (2011) recommended that administration of an effective BI activity relies upon a progression of four fundamental measures as shown in the following order; quality of information, data management master, warehousing design and analyses all collaborate together. Additionally, every development level is a necessity to the next level. Getting these variables right as recommended may demonstrate challenging to banks. business areas such as operations, sales and marketing and finance are believed to be offering greater challenges as far as application of BI is concerned as suggested by Decision path Consulting (2010).

Strategic Fit, Functional Integration and Business undertakings are faced with the challenge of distinguishing the segments that build business intelligence inside the firm, the role is to have the capacity to recognize inside the business domain what data the business has to know for fruitful execution of BI (Green, 2007). Ranjan, (2008) viewed that companies need to ensure that appropriate security and privacy protection controls are set up in the implementation of BI projects in reference to the test of potential sensitivity of information comprised.

Xia & Gong (2012) indicated that, there is a huge cost of effecting BI technologies in monetary terms. A small and medium sized company in particular, has extra outlays emanating from hardware standards and business transactional activities. They additionally said that Business Intelligence advancements involve complicated setups and related data mining methods which require specialized skill to oversee and that organization that don't utilize Business Intelligence innovations feel that Business Intelligence isn't basic to their day by day activities. Trkman, (2010) recognized that the accomplishment of IT investments in BI are not confident, the primary challenge being how best they can use the data delivered by the software. Organizations that as of now have systems set up to gather information and assemble data frequently don't have appropriate ways to put data in use for key decision making.

2.3 Theoretical Framework

This study was premised on key theories which sought to explain the basis and the role of Business intelligence on organizational performance. The following theories formed the backbone of the study; Diffusion of Innovations (DOI), Theory of Technology-Organization-Environment (TOE) and Technology Acceptance Model (TAM).

2.3.1 Diffusion of Innovations Theory

Diffusion of Innovations (DOI) Theory was developed by Rogers (1962) and later reconsidered in 2003. It is a generally utilized theory in sociology disciplines. The theory has its premise in interchanges and tries to clarify how a thought or item picks up force and spreads through a particular population or social framework. The aftermath of this diffusion is that clients take up the new thought or development.

Adoption as brought out in the theory accepts that clients respond diversely to a development contrasted with past products or advancements. This accelerates the diffusion process. Diffusion of Innovations Theory places that hypothetically, 49%-87% of the change of a trailblazers rate of adoption is clarified by its apparent traits, sort of advancement choice, and nature of social framework which the development is diffusing and the degree of the agents‟ advancement endeavors in diffusing the technology Nzuki, (2012).

The theory is valuable to both the engineers and clients of BI frameworks in assessing how these frameworks are executed in different associations. As contended by Rogers (1995), innovation, for example, utilization of OLAP is viewed as a mechanical development. This is acknowledged because of change in perspective from remain solitary data frameworks to incorporated data frameworks. As contended by Sahin, (2006), the way toward executing new developments as reported by Rogers (2003) in the book, Diffusion of Innovations, and in the publication verge on different disciplines including training and innovation. The theory championed by Rogers (2003) has created an extensive usage in appreciating technology diffusion and adoption. As referred to by Medlin (2001), the theory is helpful in researching usage of technology in business banks situations. In effecting the study, the theory is valuable in assessing the encounters of commercial banks in Kenya in their execution of Business Intelligence techniques.

Diffusion of Innovation theory has been used in business intelligence by Boonsiritomachai McGrath, and Burgress (2014), Chen (2006), and Olexova (2014).

Essentially, this DOI theory is considered as the most important theory utilized by the scholars when studying adoption model at the company level utilized as a part of information systems (IS) literatures. As indicated by this theory, the characteristics influencing technological advancement adoption are a relative advantage, multifaceted nature, compatibility, trial capacity and observable. Chen (2003) additionally utilized these ascribes to look at electronic organizations and has discovered the key impact of technological development adoption.

In notwithstanding, three of these properties had the best effect on adoption; those features are compatibility, relative advantage and complexity and neglect two attributes (trial ability and observable). Ongoing exploration has endeavored to expand diffusion of innovation theory with the Lacovou model for more unpredictable adoption situations (Dillon, & Morris, 1996). Lacovou model was presented in 1995 to study the substantial correlation in the areas of anticipated benefits (Lacovou's apparent benefits of IT innovations) and in an organizational setting, typically in organizational willingness in use of financial resources, IT resources.

Low correlation appears as the external influences (i.e. external pressures), which could be ascribed to the variances between BIS and Electronic Data Interchange as Lacovou's research environment. Lacovou model has been practiced by Borut, Oliveira, and Popovic (2014) in their studies to examine the BIS determinants in SMEs by associating the findings gathered from the survey with the determinants listed in the TOE framework by prior researches and study of the organizational perceived uses.

2.3.2 Theory of Technology-Organization-Environment Framework

The Technology-Organization-Environment (TOE) framework was displayed by Tornatzky and Fleischer, (1990) when they considered the procedure of techniques advancement. This system for the most part expresses that when a venture chooses to embrace or actualize another data innovation, the way toward settling on choices would be impacted by technology, organization, and environment. Technology context consists of the associated technology inside and backyard of the enterprise, such as tools and processes.

Organization context consists of enterprise features and resources, such as company dimension and level of centralization, extent of formalization, managerial structure, human resources, quantity of slack resources, and linkages amongst personnel. Environmental setting is the entire business structure, industry estimate, company's rivalries, macroeconomic setting and administrative condition (Tornatzky & Fleischer, 1990). Tornatzky and Fleischer clarified that despite the fact that these three settings make a few open doors for the undertakings to embrace advancement innovation, it likewise brings a few restrictions. In this manner, it is important to effect a self-evaluation before a venture chooses to adopt the innovation, and have a reasonable picture about its request and deformity keeping in mind the end goal to modify its operational structure and expand it upper hand (Angeles, 2013).

The TOE structure used to distinguish and depict the application's apparent relative preferred standpoint (the degree to which the innovation offers change over as of now accessible techniques), compatibility (simplicity of collaboration), and difficulty (simplicity of learning), and as advancement attributes that are striking to the disposition

development of the person to settle on choice in deciding the capacities of BIS in supporting their primary business task (Thong, 1999). A portion of the specialists allude this ability as a determinant, a determinant that brought the person to acknowledge the BIS innovation facilitates better strategies for outlining, assessing, and anticipating how clients will react to new innovation can be produced. This theory considers the conceivable, empowering factors affecting technological adoption normal for innovation development.

TOE framework gives a helpful systematic structure that can be utilized for concentration ofthe adoption and assimilation of various sorts of IT development (Boonsiritomachai, McGrath, & Burgress, 2014). The TOE structure has a strong theoretical basis, reliable experimental support, and the potential for application to IS advancement spaces, however particular variables distinguished inside the three settings may fluctuate crosswise over various investigations (liveira, & Martins, 2011).

2.3.3 Technology Acceptance Model

Developing information technology can't convey enhanced organizational efficiency in the event that it isn't acknowledged and utilized by potential clients. Technology Acceptance Model (TAM) is a standout among the best estimations for data frameworks utilization among professionals and scholars. TAM is in line with the theory of diffusion of innovation where technology adoption is a component of an assortment of elements including relative favorable position and usability. As per Kim (2009) TAM investigates the level of inspiration and client state of mind that decides if the client will really utilize or dismiss the framework.

Technology Acceptance Model is broadly utilized by specialists to give clarifications of use conduct in connection to adoption of information technology. TAM is actualized and tried in internet banking; web based shopping, e-government, immigration, online business. In TAM, client's convictions decide the states of mind toward utilizing the framework. Behavioral goal, thus, is dictated by this demeanor toward utilizing the framework. The ideas of perceived value and usability are individual subjective judgments about the helpfulness and simplicity toward particular framework.

Seen convenience and perceived usability are unmistakable however related constructs. In TAM, perceived value is a noteworthy conviction factor, and perceived usability is an optional conviction factor in deciding behavioral expectations toward utilizing information technology. Technology Acceptance Model is controlled by external factors which are compelling technology and usability for every day work and day by day life, state of mind toward utilizing human mentalities towards the utilization of either innovation successfully in their day by day lives and genuine framework utilization which is the apparent convenience and use of expectations as far as social impact and subjective instrumental procedures. To lessen cost advantage proportion, we should look at the hole between system design and system acceptance. So the model of the technology acceptance turns out to be imperative and basic in connection to business intelligence systems.

2.4 Conceptual Framework

Figure 2.1 represent the Conceptual framework which seeks to clearly provide a link between independent and dependent variable in the study. There is close relationship between Business intelligence analysis techniques with organization performance in banking in Kenya. This relationship can be well illustrated by a model conceptual framework which vividly demonstrates the cause and the effect of variables under study.

Independent Variables

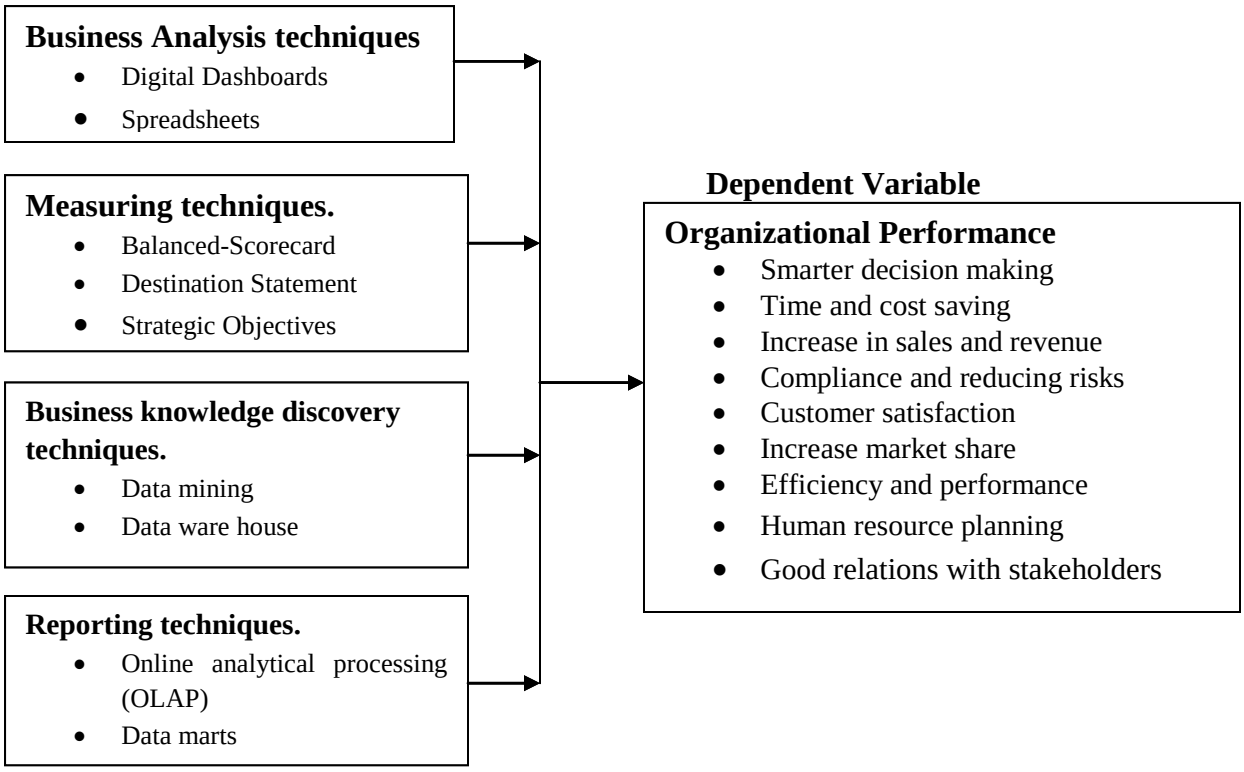

Figure 2.1: Conceptual Framework of effect of business intelligence techniques on organizational performance.

Source: Research Data (2019)

2.5 Identification of Knowledge Gap

Business intelligence contribution to an organization in a dynamic competitive business environment cannot be underscored. For one it gives numerous advantages to organizations using it. It can dispose a considerable measure of the mystery within an enterprise, improve correspondence among offices while planning and coordinating tasks, and empower organizations to react rapidly to changes in economic conditions, client inclinations, and supply network activities. BI enhances the general execution of the organization utilizing it.

Data is mostly viewed as the second most essential asset an organization has (an organization's most important resources are its human resource). So when an organization settle on decisions based on convenient and exact data, the organization can enhance its performance. BI likewise speeds up decision making, as acting rapidly and accurately on data before competing organizations do, regularly brings about intensely prevalent performance. It can likewise enhance client experiences, taking into consideration the convenient and suitable reaction to client issues and needs. Clients are the most basic viewpoint to an organization's prosperity. Without them an organization can't exist. So it is vital that organizations have data on their inclinations. The Kenyan banking sector is beginning to put out plans on where big data could deliver the most value however many financial firms are cautious about making these investments in a move towards BA as observed by Mbaluka, (2013).

There exists a gap in linking application of BI to a firm’s performance. Grossman and Siegel (2014) contended that there is little argument about the significance of business intelligence in supporting the vital objectives of a company, in any case, that there is yet to be an accord about how best to adjust analytical endeavours in the company, and further what analytical processes the firm needs to help. Firms should rapidly adjust to their evolving demands. Business Intelligence empowers firms to assemble data on the patterns in the market and innovate products or services fully expecting client's evolving needs. Competition can be a colossal obstacle on association's approach to progress. Their targets are the same as firms' and that is to expand benefits and consumer loyalty. Keeping in mind the end goal to be effective, firms must remain in front of the competitors.

The utilization of Business Intelligence alludes to specific abilities, innovations, practices, and procedures that are utilized as a component of supporting decision making in an enterprise. The uses of Business Intelligence techniques have verifiable, contemporary and even prescient view points of the business activities of an enterprise. This innovation contains certain unique actions that are intrinsic to specific frameworks. Adoption of BI techniques thus, is to help bettering quality decision making in an enterprise. It can likewise be alluded to as Decision Support System (DSS).

The acquisition of Business Intelligence techniques is basic to the smooth and facilitating activity of every single organization. Be that as it may; it has not been completely integrated in numerous organizations and association, this has brought about poor communication inside the distinctive organizations and thus have lost coordination and mismanage.

This study therefore, sought to assess the effect of effects of BI techniques on organizational general performance. This business activity on the utilization and the estimation of BI as a technique forms the basis, the contribution of this study will seek to investigate the impacts of Business Intelligence Techniques on Organizational Performance in Banking Sector with exceptional spotlight on the selected commercial banks in south rift locale Counties.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section features the general methodology that was utilized to complete this study. It exemplifies the research design, location of study, the target population, Sample and sampling methodology, data gathering instruments, data collection procedures, Data analysis and presentation and ethical issues.

3.2 Research Design

The study embraced a descriptive and inferential research design. Research design is the design for satisfying research objectives and in addition answering research hypothesis, Adams, (2007). In other words, it is a ground breaking strategy deciding the methodology and techniques for gathering and dissecting the required information. It ensured that the study was essential to the issue and that it used simple and straightforward strategies. This investigation utilized descriptive research design. The primary reason for engaging descriptive research is the clarification of the circumstance, as it exists by and by. This study described and assessed the effectiveness of Business Intelligence and organizational performance in selected commercial banks in South Rift Counties with special focus on Bomet, Kericho and Narok counties. According to William (2006), descriptive research design is a procedure of gathering information to answer inquiries or test theory concerning the current state of the subjects in the investigation. The plan was fitting for studying the performance behavior of an organization.

3.3 Location of Study

The study was carried out in selected counties in south Rift Region comprises of Kericho, Bomet and Narok counties. The location of study had several commercial banks making it possible for the study to be conducted in the banking sector. Moreover the study location did not cover a wide area making it easy for the researcher to carry out the study with affordable financial costs.

3.4 Target Population

The target population of this study was 820 employees in selected commercial banks in Kericho, Bomet and Narok Counties. The respondents included managers and other staffs (tellers, credit officers, ICT officers, bank relation officers, marketing officers, customer service officers, operation officers). The study mainly focused on the effectiveness of Business Intelligence techniques and organizational performance in the banking sector.

Table 3.1

Target Population of The Study

county	strata	commercial banks										
		BCYS	**EQTY**	**KCB**	**COOP**	**STD**	**NBK**	**FMY**	**BOA**	**TNB**	**SIDIAN**	**TTLS**
Kericho	**Managers**	10	10	10	10	10	10	10	10	10	10	**100**
	Other staffs	20	20	20	20	20	20	20	20	20	20	**200**
Bomet	**Managers**	10	10	10	10	10	10	10	10	10	10	**100**
	Other staffs	20	20	20	20	15	15	15	15	15	15	**170**
Narok	**Managers**	10	10	10	10	10	10	10	10	5	5	**90**
	Other staffs	20	20	20	20	15	15	15	15	10	10	**160**
	TOTAL	90	90	90	90	80	80	80	80	70	70	**820**

KEY: (N) - Target population (Total =820)

Source: Banker Association of Kenya (2019)

3.5 Sample Size and sampling procedures

Sampling is the process by which a relatively small number of individual, object or event is selected and analyzed in order to find out something about the entire population. 30% of the target population will be selected. This is in agreement with the assertion advanced by Mugenda and Mugenda (2003) that recommended a 30% sample size to reflect the overall position of the entire population under focus. Sample size refers to the specific size of the group or groups being studied in a research (Valarie and McColl, 2010). Purposive sampling was employed in arriving at sample size of managers while multistage random sampling was used on other staffs followed by simple random sampling from each stratum that was used in the research study. According to Mugenda and Mugenda (2003), purposive sampling allows a researcher to use cases that have the required information with respect to the objectives of the study. The strata included the branch managers and other staffs. (Tellers, operation officers, ICT officers, marketing/sales officers, and customer care service, credit/ loan officers, and customer relationship. Managers were purposively selected because they were believed to be most familiar and had knowledge of the techniques under study. This choice was made because it gave each item in the population an equal probability of being selected. The following table vividly shows the sample distribution.

Table 3.2

Sample Size

SAMPLE SIZE OF OTHER STAFFS AS INDICATED IN TABLE 3.1

STRATA	**COMMERCIAL BANKS**																			
	BCYS		**EQTY**		**KCB**		**COOP**		**STD**		**NBK**		**FMLY**		**BOA**		**TNB**		**SDN**	
	n = (30% of N)																			
	N	N	N	N	N	N	N	n	N	n	N	n	N	N	N	n	N	N	N	n
Managers	30	9	30	9	30	9	30	9	30	9	30	9	30	9	30	9	25	7	25	7
Tellers	10	3	10	3	10	3	10	3	10	3	10	3	10	3	10	3	10	3	10	3
operation officers	10	3	10	3	10	3	10	3	5	1	5	1	5	1	5	1	5	1	5	1
ICT	10	3	10	3	10	3	10	3	5	1	5	1	5	1	5	1	5	1	5	1
Marketing officers	10	3	10	3	10	3	10	3	10	3	10	3	10	3	10	3	5	1	5	1
Customer service officers	5	2	5	2	5	2	5	2	5	2	5	2	5	2	5	2	5	2	5	1
Credit officers	10	3	10	3	10	3	10	3	10	3	10	3	10	3	10	3	10	3	10	3
Relationship officers	5	2	5	2	5	2	5	2	5	2	5	2	5	2	5	2	5	1	5	1
TOTAL	**90**	**28**	**90**	**28**	**90**	**28**	**90**	**28**	**80**	**24**	**80**	**24**	**80**	**24**	**80**	**24**	**45**	**19**	**45**	**18**

Source: Research Data (2019)

(N) - Target population (Total =820)

(n)- Sample size (30% of N) (Total = 246)

Key: MGR; - MANAGER**, FMY; -** FAMILY BANK**, SDN;** - SIDIAN BANK**, STD;** - STANDARD BANK**, BCYS; -** BARCLAYS, **CTY**; - COUNTY**, KCO**; - KERICHO,**BMT**; - BOMET, **NRK**; - NAROK

3.6 Data Collection Instruments.

A structured questionnaire was employed to collect primary data from each respondent from the commercial banks. The questionnaire included open and close ended questions. The questionnaire was subdivided into four areas outfitted towards gathering data in accordance with the study objectives. The respondents of this study were the Managers, bank tellers, customer service clerks, operation managers, ICT and internet banking officers, credit officers, and customer relationship officers marketing officers.

3.6.2 Validity

Validity is a measure of how well a test measures what should gauge (Kombo and Tromp, 2006). Validity alludes to the degree to which the data gathering instrument measures what it should gauge. Naibei (2015) characterizes validity as the capacity of a measuring instrument to quantify what was proposed to be measured. The construct validity of the instrument was subjected to scrutiny from supervisors and lecturers from the subject area. So as to decide whether the research instrument would measure what was expected to be measured; approval systems was acquired from significant authorities including consultations with the research supervisors who had the mastery of research content. Their contributions were fused in the instruments before the actual data gathering.

3.6.3 Reliability

The reliability test was done using Cronbach's alpha were a value of 0.70 and above indicated that the research instrument was reliable, Pre-testing provided a check on the practicality of the proposed technique for coding data and showed up faults and ambiguities in the instruments for data gathering. It yielded recommendations for improving data collection methods.

The data collection instrument was piloted tested to guarantee their unwavering validity and reliability. A pilot test is a trial of research instrument so as to prepare for use in the research, (Monette et al., 2002). The pilot was conducted in two commercial banks in Nakuru where 30 respondents participated. The reason for the pilot study was to find out the shortcoming of the research instrument and help in adjusting them thereof. Table 3.3 show the Cronbach alpha result of the variables used in the study.

Table 3.3

Reliability Test

Constructs	**Cronbach Alpha**	**N of Items**
BI Analytical Techniques	0.866	7
BI Measuring Techniques	0.897	6
BI Knowledge Discovery techniques	0.839	10
BI Reporting techniques	0. 879	10
Average Reliability of Instrument	**0.867**	**35**

Source: Research Data (2019)

In order for the data collection instrument to be considered as reliable, all the constructs returned Cronbach alpha coefficients greater than 0.8 indicating acceptable internal consistency of the data collection instrument as presented on table 4.1. According to Sekaran (2003), a Cronbach alpha of 0.8 is good, 0.7 is an acceptable range while if it is 0.6 and below, is poor.

3.7 Data Collection Procedures

The researcher sought for authority from University of Kabianga (UoK), Management of Commercial Banks to enable him carry out the research. A research permit was also obtained from NACOSTI before the data collection process commenced. The questionnaires were administered to the respondents by the researcher in person.

3.8 Data Analysis and Presentation

Questionnaires were collected and checked for accuracy and completeness then tabulated for analysis facilitation. Demographic data was analyzed by use of frequency and percentages. The data was then analyzed and interpreted to give meaning, and eventually used to draw conclusions. Data was presented by use of bar graphs, percentages, frequency distribution, pie charts and tables. Descriptive data analysis method was used to describe the data collected. The regression model will be in the form:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where:

Y = Organizational Performance, α = Constant/the intercept point of the regression line and the x-axis, β = the slope/gradient of the regression line, X_1 = Business Analysis Techniques, X_2 = Measuring Techniques, X_3 = Business Knowledge techniques X_4 = Reporting Techniques and ε = Error term

3.9 Ethical Considerations

The researcher maintained confidentiality; avoided plagiarism, manipulation of respondents and manipulation of results. Information on the nature and reason for the study was elucidated to the respondents as a way of giving adequate information before they choose to partake. The researcher embraced and acknowledged any mistakes because of exclusion or commission while incorporating the report of the study. Permit from NACOSTI was sought and was used to get permission from banks.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the research findings for the study on the effect of Business Intelligence Techniques on organizational performance in Banking Sector in Kenya. The findings are presented on basis of descriptive and inferential statistical analysis. The results from the analysis formed the basis for discussions.

4.2 Response Rate

Out of the 246 questionnaires that were administered, 233 were properly filled and returned. This indicated a response rate of 94.7%. Chen (1996) argued that the larger the response rate, the smaller the non-response error, Further, Babbie (1990) suggested that a response rate of 50% is adequate 60% is good and 70% and above very good for analysis. This implies that 94.7% percent response rate was very appropriate for further data analysis.

4.3 Demographics Information of the Respondents

This section presents and discusses results of descriptive statistics of the demographic characteristics of the respondents. Frequencies and percentages were used to examine the distribution of the respondents.

4.3.1 Respondents' Gender

The respondents were asked to indicate their gender and the findings are as per table 4.1.

Table 4.1

Gender of Respondents

Gender	Frequency	Percentage (%)
Male	151	64.8
Female	82	35.2
Total	**233**	**100.0**

Source: Research Data (2019)

According to the findings of table 4.1 on gender of the respondents, the findings reveals that male were majority 151 (64.8%) of the respondents while the female respondents were 82 representing 35.2%. This reveals that one third gender rule is being adhered to by the commercial banks and that all the gender participated in the study.

4.3.2 Level of Education

The study sought to determine the level of education of the respondents. The results on table 4.2

Table 4.2

Level of Education

Level of Education	Frequency	Percentage (%)
Secondary	4	1.7
College	24	10.3
University	205	88.0
Total	**233**	**100.0**

Source: Research Data (2019)

According to the results of table 4.2 on level of education, majority of the respondents 205 (88%) had university degree; those who had college diploma were 24 representing

10.3% while those who had secondary level qualification were 4 representing 1.7%. This reveals that all the respondents were educated enough to respond to the study questions.

4.3.3 Work Experience

The study sought to determine how long the respondents had worked in the sampled bank and the results are as presented in table 4.3

Table 4.3

Work Experience

Work Experience	Frequency	Percentage (%)
Less than 2 years	58	24.9
2 - 5 years	97	41.6
6 - 9 Years	57	24.5
Over 10 years	21	9.0
Total	**233**	**100.0**

Source: Research Data (2019)

Table 4.3 on work experience reveals that majority of the respondents who were 97 representing 41.6% had worked for between two to five years; those who had worked for less than two years were 58 representing 24.9%; those who had worked for six to nine years were 57 representing 24.5% and those who had worked for over ten years were 21 representing 9.0%. This reveals that all the respondents had the requisite experience to respond to the study questionnaire.

4.3.4 Position Held

Respondents were asked to indicate the position they held in the commercial banks in the sampled banks in Kericho, Bomet and Narok Counties and their response are as per table 4.4.

Table 4.4

Job Position

Job Position	Frequency	Percentage (%)
Manager	67	28.8
Teller	47	20.2
Operation Officers	45	19.3
ICT	12	5.2
Marketing Officers	16	6.9
Customer Service Officer	4	1.7
Credit Officer	27	11.6
Relationship Officer	15	6.4
Total	**233**	**100.0**

Source: Research Data (2019)

Table 4.4 reveals that the majority of the respondents who were 67 representing 28.8% were managers; tellers were 47 representing 20.2%; operation officers were 45 representing 19.3%; credit officers were 27 representing 11.6%; marketing officers were 16 representing 6.9%; relationship officers were 15 representing 6.4% while customer service were 4 representing 1.7%.

This reveals that all position holders participated in the study and thus were able to respond on business intelligence techniques and performance of their banks..

4.3.5 Age of Respondents

The study sought to establish the age group of the respondents and the response are as per table 4.5

Table 4.5

Ages of Respondents

Ages of Respondents	Frequency	Percentage (%)
Less than 25 Years	66	28.3
25 - 35 Years	163	70.0
45 years and Above	4	1.7
Total	**233**	**100.0**

Source: Research Data

Majority of the respondents who participated in the study according to table 4.5 were of between 25 years and 35 years who were 163 representing 70.0%; those who were less that 25 years were 66 representing 28.3% and those who were 45 year and above were 4 representing 1.7%. This reveals that all the working age group participated in the study.

4.4 Effectiveness of Business intelligence Analysis Techniques on Organizational Performance

Respondents were asked to indicate the level of their agreement on effects of business intelligence techniques used in their organization on the performance of the bank.

The results are as per table 4.6 where 5 is Strongly Agree, 4- Agree, 3 Undecided, 2 Disagree and 1 is Strongly Disagree.

Table 4.6

Business Intelligence Analysis Techniques and Organizational Performance

BI Analysis Techniques	**1**	**2**	**3**	**4**	**5**
Data warehouse techniques affects performance in our organization	38 (16.3%)	62 (26.6%)	4 (1.7%)	58 (24.9%)	71 (30.5%)
Data mining is used to improve performance in our organization	38 (16.3%)	58 (24.9%)	4 (1.7%)	62 (26.6%)	71 (30.5%)
Data visualization enables the presentation of information in our organisation	68 (29.2%)	38 (16.3%)	6 (2.6%)	44 (18.9%)	77 (33.4%)
Online Analytical processing (OLAP) facilitates the analysis of information online in our organisation	54 (23.2%)	40 (17.2%)	4 (1.7%)	57 (24.5%)	78 (34.5%)
Statistical examination is a tool used to enhance data analysis in our organization.	49 (21.0%)	60 (25.5%)	15 (6.4%)	38 (16.3%)	71 (30.5%)
Prescient models aids the analysis of information in our organisation	53 (22.7%)	53 (22.7%)	6 (2.6%)	56 (24.0%)	65 (27.9%)
Dash boards effects the analysis of information positively in our organisation.	74 (31.8%)	36 (15.5%)	4 (1.7%)	75 (32.2%)	44 (18.9%)

Source: Research Data (2019)

According to the results in table 4.6, majority of the respondents who were 71 representing 30.5% strongly agreed that data warehouse is a business intelligence techniques which is a focal store of data that can be examined so as to settle on better decision and those who agreed were 58 respondents representing 24.9%.

The respondent who disagreed that data warehouse is a business intelligence techniques which is a focal store of data that can be examined so as to settle on better decision were 62 representing 26.6% and those who strongly disagreed were 38 respondents representing 16.3% while 4 respondents representing 1.7% were undecided. Data mining which is a business intelligence techniques used to extract information in a database was an effective business intelligence technique used by banks since majority of respondents who were 71 representing 30.5% strongly agreed and 62 respondents representing 26.6% agreed. The respondents who disagreed were 58 representing 24.9% and 38 respondents representing 16.3% strongly disagreed that data mining was an effective business intelligence technique used by banks while 4 respondents representing 1.7% were undecided.

Data visualization which is a business intelligence technique which uses graphs, charts and tables to display summarized information thus one can easily compare the performance of bank was used by majority of the banks since majority of the respondents who were77 representing 33.4% strongly agreed while 44 respondents representing 18.9% agreed to it. The respondents who strongly disagreed that data visualization are used by bank were 68 representing 29.2% and 38 respondents representing 16.3% who agreed while 6 respondents representing 2.6% were undecided.

Online analytical processing which is a business intelligence technique for automatic online analysis of data was used by majority of the banks as revealed by majority of the respondents who were 78 representing 33.4% who strongly agreed as a well as 57 respondents who agreed to it.

The respondents who strongly disagreed that online analytical processing techniques was being used by banks were 54 representing 23.2% so do 40 respondents representing 17.2% who disagreed while 4 respondents representing 1.7% were undecided. Statistical examination which is one of the business intelligence technique used for making quantitative decisions about a process or process was used by most of the bank since majority of the respondents who were 78 representing 34.5% strongly agreed to it so do 57 respondents representing 24.5% who agreed to it. The respondents who strongly disagreed that bank were using statistical extermination were 54 representing 23.2% so do 40 respondents representing 17.2% who agreed while 4 respondents representing 1.7% were undecided.

Prescient model a business intelligence technique used to give knowledge of events before they take place was used my majority of the banks as revealed by the majority of the respondents who were 65 representing 27.9% and 56 respondents representing 24.0% agreed to it. The respondents who strongly agree and those who disagreed were each 53 representing 22.7% while 6 respondents representing 2.6% were undecided. Dash board use by banks as one of the business intelligence technique used for progress report was embraced by majority of the banks since majority of the respondents who were 75 representing 32.2% agreed while 44 respondents representing 18.9% strongly agreed to it. The respondents who strongly disagreed that banks uses dash board to measure progress were 74 representing 31.8% while 36 respondents representing 15.5% disagreed. The respondents who were undecided were 4 representing 1.7%.

This reveals that data warehouse, data mining, data visualization, online analytical processing, statistical examination, prescient models and dash board were effective Business Intelligence Analysis Techniques and that they greatly affect the performance of banks.

4.5 Influence of Business Intelligence Analysis Techniques on performance of Organization

Respondents were asked to indicate the level of their agreement on the effectiveness of business intelligence analysis techniques on the performance of the bank. The results are as per table 4.7 were on a Likert scale where 5 was Strongly Agree, 4- Agree, 3 Undecided, 2 Disagree and 1 is Strongly Disagree.

Table 4.7

Influence of Business Intelligence Analysis Techniques on organizational performance

Influence of BI analysis techniques	1	2	3	4	5
Enhance quick decision making in your organisation	65 (27.9%)	36 (15.5%)	2 (0.9%)	73 (31.3%)	57 (24.5%)
Increased customer value in your organisation	73 (31.3%)	36 (15.5%)	4 (1.8%)	75 (32.2%)	45 (19.2%)
Empower Executive to make right projections in your organisation	36 (15.5%)	69 (29.6%)	4 (1.8%)	79 (33.8%)	45 (19.3%)
Minimize risks or uncertainties in your organisation.	64 (27.5%)	46 (19.7%)	2 (0.9%)	79 (33.9%)	42 (18.0%)
Control and manage situations in your organisation	53 (22.7%)	48 (20.6%)	4 (1.7%)	62 (26.6%)	62 (26.6%)
Improve competitive advantage of the organisation	53 (22.7%)	56 (24.0%)	4 (1.7%)	62 (26.6%)	58 (24.9%)

Source: Research Data (2019)

Table 4.7 reveals that business intelligence analysis techniques enables quick decision making since majority of the respondents who were 73 representing 31.3% agreed and 57 respondents representing 24.5% strongly agreed to it. The respondents who strongly disagreed that business intelligence analysis techniques facilitate quick decision making were 65 representing 27.9% so do 36 respondents representing 15.5% who agreed. The respondents who were undecided were 2 representing 0.9%. Use of business intelligence analysis techniques by banks lead to increase in the number of customer value as agreed by a majority of the respondents who were 75 representing 32.2% and 45 respondents representing 19.2% who strongly agreed. The respondents who strongly disagreed that business intelligence analysis techniques increases customer value were 73 representing 31.3% and 36 respondents representing 15.5% who disagreed. The respondents who were undecided were 4 representing 1.8%.

Business intelligence analysis technique empowers executive to make right projection as agreed by majority of the respondents who were 79 representing 33.8% and 45 respondents representing (19.3%) who strongly agreed. The respondents who disagreed that business intelligence analysis technique empowers executive to make right projection were 69 representing 29.6% and 36 respondent representing 15.5% strongly disagreed while 4 respondents representing 1.8% were undecided. Business intelligence analysis techniques minimize risks and uncertainties since majority of who were 79 representing 33.9% agreed to it so do 42 respondents representing 18.0% who agreed. The respondents who strongly disagreed that business intelligence analysis technique minimize risks and uncertainties were 64 representing 27.5% and 46 respondents representing 19.7% who disagreed. The respondents who were undecided were 2 representing 0.9%.

Control and management of situations are actualized with the use of business intelligence analysis techniques as strongly agreed and agreed by a majority of the respondents who were each 62 representing 26.6% while the respondents who strongly disagreed that control and management of situations are actualized with the use of business intelligence analysis techniques were 53 representing 22.7% and 48 respondents representing 20.6% disagreed. The respondents who were undecided were 4 representing 1.7%. Banks who use business intelligence analysis techniques are more competitive that those who do not use it, this is as per the response of the majority of the respondents who were 62 representing 26.6% who agreed and 58 respondents representing 24.9% who strongly agreed. The respondents who disagreed that use of business intelligence analysis techniques increases the competiveness of a bank were 56 representing 24.0% and 53 respondents representing 22.7% who strongly disagreed while 4 respondents representing 1.7% were undecided.

This reveals that business intelligence analysis techniques; enables quick decision making, increases customer value, empower executive to make right projections, minimize risks or uncertainties, control and manage situations and improve competitive advantage

4.6 Influence of Measuring Techniques on Organizational Performance

Respondents were asked to indicate the level of their agreement on the influence of business intelligence measuring techniques on the performance of the bank. The results were on a Likert scale where 5 was Strongly Agree, 4- Agree, 3 Undecided, 2 Disagree and 1 is Strongly Disagree.

Table 4.8

Influence of Business Intelligence Measuring Techniques on organizational performance

Measuring Techniques	1	2	3	4	5
Balance scorecard	53 (22.7%)	52 (21.9%)	4 (1.7%)	72 (30.9%)	53 (22.7%)
Destination statement	36 (15.5%)	56 (24.0%)	6 (2.6%)	75 (32.2%)	60 (25.8%)
Strategic objectives	38 (16.3%)	58 (24.9%)	8 (3.4%)	75 (32.2%)	54 (23.2%)
Strategic linkage model and perspective	53 (22.7%)	49 (21.0%)	8 (3.4%)	68 (29.2%)	55 (23.6%)
Measures and initiatives	54 (23.2%)	58 (24.9%)	4 (1.7%)	59 (25.3%)	58 (24.9%)

Source: Research Data (2019)

According to table 4.8, balance scorecard which was business intelligence measuring techniques used to measure performance matrix so as to identify and improve various internal functions of a business and their resulting external outcome was majorly used by the sampled banks since the majority of the respondents who were 72 representing 30.9% agreed to it and 53 respondent representing 22.7% strongly agreed. The respondents who strongly disagreed were 53 representing 22.7% and 52 respondents representing 21.9% disagreed while 4 respondents representing 1.7 % were undecided.

Destination statement which is a business intelligence measuring technique which offered a snapshot of what an organization is expected to be like at a specific point in time as the organization works towards achieving the elements of it vision was greatly used by the banks according to the response of the majority of the respondents who were 75 representing 32.2% who agreed and 60 respondents representing 25.8% who strongly agreed. The respondents who disagreed were 56 representing 24.0%, those who strongly disagreed were 36 representing 15.5% and those who were undecided were 6 representing 2.6%.

Strategic objectives and goals was another business intelligence measuring techniques which denoted the highest goals of the organization or an individual was adopted by the majority of the banks since majority of the respondents who were 75 representing 32.2% agreed to it and 54 respondents representing 23.2% strongly agreed. The respondents who disagreed were 58 representing 24.9% and those who strongly disagreed were 38 representing 16.3% while those who were undecided were 8 representing 3.5%.

Strategic linkage model and perspective were the banks links objectives which are implemented in the form of projects to a strategy was another business intelligence measuring technique adopted by the majority of the banks as agreed by 68 respondents representing 29.2% and strongly agreed by 55 respondents representing 23.6%. The respondents who strongly disagreed were 53 representing 22.7% and those who disagreed were 49 representing 21.0% while the respondents who were undecided were 8 representing 3.4%.

Measures and initiatives which is a business intelligence measuring techniques which identifies a plan or course of actions to be taken so as to achieve a particular purpose was used by a majority of the banks as agreed by a majority of respondents who were 59 representing 25.3% and 58 respondents representing 24.9% who strongly agreed. The respondents who disagreed were 58 representing 24.9% and those who strongly disagreed were 54 representing 23.2% while those who were undecided were 4 representing 1.7%. This reveals that balance scorecard, destination statement, strategic objectives, strategic linkage model and perspective, measures and initiatives were effective form of business intelligence measuring techniques which banks ought to adopt.

Respondents were asked to rate the level of influence of business intelligence measuring technique on organization performance in their banks. The response were on a Likert scale where 5 was Strongly Agree, 4- Agree, 3 Undecided, 2 Disagree and 1 is Strongly Disagree.

Table 4.9

Influence of Business intelligence measuring techniques on organizational performance

Influence BI Measuring Techniques	1	2	3	4	5
Balanced score card influences organisational performance	0 (0.0%)	18 (7.7%)	8 (3.4%)	101 (43.3%)	106 (45.5%)
Destination statement is used to influence the performance of an organisation	0 (0.0%)	18 (7.7%)	4 (1.7%)	130 (55.8%)	80 (34.4%)
Strategic objectives are key parameters of organisational performance.	0 (0.0%)	13 (5.6%)	2 (0.9%)	91 (39.1%)	127 (54.5%)
Strategic linkage model and perspectives are useful in measuring organisational performance	4 (1.7%)	31 (13.3%)	2 (0.9%)	122 (52.4%)	74 (31.8%)
Measures and initiatives in your organisation influences performance positively	0 (0.0%)	14 (6.0%)	8 (3.4%)	116 (49.8%)	95 (40.8%)

Source: Research Data (2019)

According to the response in table 4.9, balance score card which was performance matrix used to identify and improve various internal functions of a business and their resulting external outcome was most effective business intelligence measuring techniques adopted by the majority of the banks since majority of the respondents who were 106 representing 45.5% strongly agreed and 101 respondents representing 43.3% agreed. The respondents who disagreed were 18 representing 8.2% while 8 respondent representing 3.4% were undecided.

Destination statement which offers snapshot of what an organization is expected to be like at a specific point in time as the organization work towards the achievement of its vision was influential business intelligence measuring techniques which was adopted by the majority of the banks as agreed by majority of the respondents who were 130 representing 55.8% and 80 respondents representing 34.4% who strongly agreed. The respondents who disagreed were 18 representing 7.7% while 4 respondents representing 1.7% were undecided. Strategic objectives which denoted the highest goals of the bank and individual staff output was influential business intelligence measuring techniques since majority of the respondents who were 127 representing 54.5% strongly agreed and 91 respondents representing 39.1% agreed. The respondents who disagreed were 13 representing 5.6% while 2 respondents representing 0.9% were undecided.

Strategic linkage model and perspective which were often implemented in the form of projects in a strategy was an influential business intelligence measuring techniques used by banks since majority of the respondents who were 122 representing 52.4% agreed and 74 respondents representing 31.8% strongly agreed. The respondents who disagreed were 31 representing 13.3% and 4 respondents representing 1.7% strongly disagreed while 2 respondents representing 0.9% were undecided. Measures and initiatives which were plans of actions taken to achieve a particular purpose were being embraced by the banks since majority of the respondents who were 116 representing 49.5% agreed and 95 respondents representing 40.8% strongly agreed. The respondents who disagreed were 14 representing 6.0% while 8 respondents representing 3.4% were undecided.

This implies that balance scorecard, destination statement, strategic objectives, strategic linkage model and perspective, measures and initiatives were influential form of business intelligence measuring techniques adopted by commercial banks.

4.7 Effectiveness of Business Knowledge Discovery Techniques on organizational performance

Respondents were asked to give their response on the influence of Business Knowledge Discovery techniques on Organization Performance in Banking Sector. Their response were on a Likert scale where 5 - Strongly Agree, 4 – Agree, 3- Undecided, 2 – Disagree, 1 - Strongly Disagree and the response are shown in table 4.10.

Table 4.10

Effectiveness of Business Knowledge Discovery Techniques on organizational performance

Statement	1	2	3	4	5
Discovers patterns and relationships hidden in data	55 (23.6%)	36 (15.5%)	16 (6.9%)	72 (30.9%)	54 (23.2%)
Enumerate patterns in your organisation	47 (20.2%)	34 (14.6%)	8 (3.4%)	73 (31.3%)	71 (30.5%)
Evaluate products in your organisation	38 (16.3%)	42 (18.0%)	22 (9.4%)	60 (25.8%)	71 (30.5%)
Identification of subsets of enumerated patterns in your organisation	49 (21.0%)	53 (22.7%)	15 (6.4%)	45 (19.3%)	71 (30.5%)
Generate management theories in your organisation.	46 (19.7%)	48 (20.6%)	8 (3.4%)	56 (24.0%)	75 (32.2%)
Help in strategic planning in your organisation.	44 (18.9%)	51 (21.9%)	9 (3.9%)	54 (23.2%)	75 (32.2%)
Enhance Customer Relationship in your organisation.	44 (18.9%)	43 (18.5%)	13 (5.6%)	60 (25.8%)	73 (31.3%)
Help to monitor operations in your organisation.	44 (18.9%)	53 (22.7%)	5 (2.1%)	63 (27.0%)	68 (29.2%)
Enhance the study of product profitability in your organisation.	36 (15.5%)	40 (17.2%)	10 (4.3%)	77 (33.0%)	70 (30.0%)
Assist in data collection, storage and processing in your organisation.	38 (16.3%)	49 (21.0%)	4 (1.7%)	77 (33.0%)	65 (27.9%)

Source: Research Data (2019)

Table 4.10 reveals that business knowledge discovery techniques was used to discover patterns and relationship hidden in data according to the response of the majority of the respondents who were 72 representing 30.9% who agreed and 54 representing 23.4% who strongly agreed. The respondents who strongly disagreed that the business knowledge discovery techniques was used to discover patterns and relationship hidden in data were 55 representing 23.6% and those who disagreed were 36 representing 15.5%

while those who were undecided were 16 representing 6.9%. Business knowledge discovery techniques was used to enumerate patterns as agreed by majority of the respondents who were 73 representing 31.3% and 71 respondents representing 30.5% who agreed. The respondents who strongly disagreed that business knowledge discovery techniques was used to enumerate patterns were 47 representing 20.2% and those who disagreed were 34 representing 14.6%. The respondents who were undecided were 8 representing 3.4%.

Business knowledge discovery pattern was used by banks to evaluate product according to the majority of the respondents who were71 representing 30.5% who strongly agreed and 60 respondents representing 25.8% who agreed. The respondents who disagreed that business knowledge discovery pattern was used by banks to evaluate product were 42 representing 18.0% and 38 respondent representing 16.3% who strongly disagreed while 22 respondent representing 9.4% were undecided. Majority of the respondents who were 71 representing 30.5% strongly agreed that business knowledge discovery techniques was used in the identification of subset of enumerated patterns and the respondents who agreed were 45 representing 19.3%.

Respondents who disagreed that business knowledge discovery techniques was used in the identification of subset of enumerated patterns were 53 representing 22.7% and 49 respondents representing 21.0% strongly disagreed while 15 respondents representing 6.4% were undecided. Majority of the respondents who were 75 representing 32.2% strongly agreed that business knowledge discovery techniques were used in the generation of theory so do 56 respondents representing 24.0% agreed.

The respondents who disagreed that business knowledge discovery techniques were used in the generation of theory were 48 representing 20.6% and 46 respondents representing 19.7% strongly disagreed while 8 respondents representing 3.4% were undecided. Business knowledge discovery techniques was used by majority of the banks in strategic planning since majority of the respondents who were 75 representing 32.2% and 54 respondents representing 23.2% agreed. Respondents who disagreed that business knowledge discovery techniques was used by banks in strategic planning were 51 representing 21.9% and 44 respondents representing 18.9% strongly disagreed while 9 respondents representing 3.9% were undecided.

Majority of the respondents who were 73 representing 31.3% strongly agreed so do 60 respondents representing 25.8% agreed that business knowledge discovery techniques was used by banks to enhance customer relationship. Respondents who strongly disagreed that business knowledge discovery techniques was used by banks to enhance customer relationship were 44 representing 18.9% as well as 43 respondents representing 18.5% who disagreed while 13 respondents representing 5.6% were undecided.

Majority of the respondents who were 68 representing 29.2% strongly agreed and 63 respondents representing 27.0% agreed that business knowledge discovery technique helped banks to monitor operations. Respondents who disagreed that business knowledge discovery technique helped banks to monitor operations were 53 representing 22.7% so do 44 respondents representing 18.9% who strongly disagreed while 5 respondents representing 2.1% were undecided.

Business knowledge discovery techniques was used by banks to enhance the study of product profitability according to majority of the respondents who were 77 representing 33.0% who agreed and 70 respondents who strongly agreed to it.

The respondents who disagreed that business knowledge discovery techniques was used by banks to enhance the study of product profitability were 40 representing 17.2% as well as 36 respondents representing 15.5% who strongly disagreed to it while 10 respondents representing 4.3% were undecided. Business knowledge discovery techniques was used by banks to assist in data collection, storage and processing as noted by majority of the respondents who were 77 representing 33.0% who agreed and 60 respondents representing 27.9% who strongly agreed. The respondents who disagreed that business knowledge discovery techniques was used by banks to assist in data collection, storage and processing were 49 representing 21.0% and 38 respondent representing 16.3% who strongly disagreed while 4 respondents representing 1.7% were undecided.

This reveals that business knowledge discovery techniques enables commercial banks to discover patterns and relationships hidden in data, enumerate patterns, evaluate products, identify subsets of enumerated patterns, generate theory, help in strategic planning, enhance customer relationship, help to monitor operations, enhance the study of product profitability and assist in data collection, storage and processing.

4.8 Influence of Reporting Techniques on Organizational Performance

Respondents were asked to indicate the level of agreement on the influence of reporting techniques on organizational performance in banking sector.

The responses were on a Likert scale where 5 - Strongly Agree, 4 – Agree, 3- Undecided, 2 – Disagree, 1 - Strongly Disagree.

Table 4.11

Influence of Reporting Techniques on Organizational Performance

Level Of Influence	**1**	**2**	**3**	**4**	**5**
Discover trends and analysis of critical factors in your organisation.	57 (24.5%)	38 (16.3%)	10 (4.3%)	73 (31.3%)	55 (23.6%)
Generate aggregate views on state of the business in your organisation	38 (16.3%)	31 (13.3%)	10 (4.3%)	73 (31.3%)	81 (34.8%)
Store, analyse, project business performance in your organisation	38 (16.3%)	35 (15.0%)	21 (9.0%)	79 (33.9%)	60 (25.8%)
Collect and integrate data in your organisation	50 (21.5%)	40 (17.2%)	12 (5.2%)	73 (31.3%)	58 (24.9%)
Propagate data in records management in your organisation	47 (20.2%)	53 (22.7%)	6 (2.6%)	66 (28.3%)	61 (26.2%)
Applied in tactical decision making in your organisation	59 (25.3%)	32 (13.7%)	12 (5.2%)	73 (31.3%)	57 (24.5%)
Contains live data and retain minimal information in your organisation	60 (25.8%)	38 (16.3%)	12 (5.2%)	77 (33.0%)	46 (19.7%)
Facilitate end user analysis of data in your organisation	60 (25.8%)	40 (17.2%)	4 (1.7%)	73 (31.3%)	56 (24.0%)
Provide data for departmental decision making in your organisation	53 (22.7%)	54 (23.2%)	9 (3.9%)	62 (26.6%)	55 (23.6%)
Support business functions and process in different departments in your organisation.	48 (20.6%)	56 (24.0%)	4 (1.7%)	59 (25.3%)	66 (28.3%)

Source: Research Data (2019)

According to Table 4.11 majority of the respondents who were 73 representing 31.3% agreed and 55 respondents representing 23.6% strongly agreed that reporting techniques used by banks has enable them to discover trends and analyse critical factors.

Respondents who strongly disagreed that reporting techniques used by banks has enable them to discover trends and analyze critical factors were 57 representing 24.5% so do 38 respondents representing 16.3% who disagreed while 10 respondents representing 4.3% were undecided. Reporting techniques adopted by the banks had enabled them to generate aggregate views on state of the business, this is according to majority of the respondents who were 81 representing 34.8% who strongly agreed and 73 respondents representing 31.3% who agreed. The respondents who strongly disagreed were 38 representing 16.3% and 31 respondents representing 13.3% disagreed while 10 respondents representing 4.3% were undecided.

Banks had been able to store and analyze projects with the help of reporting techniques they had adopted since majority of the respondents who were 79 representing 33.9% agreed and 60 respondents representing 25.8% strongly agreed to it. The respondents who strongly disagreed were 38 representing 16.3% and 35 respondents representing 15.0% disagreeing while 21 respondent representing 9.0% were undecided. Reporting techniques has enable banks to collect and integrate data. This is according to majority of the respondents who were 73 representing 31.3% who agreed and 58 respondents representing 24.9% who strongly agreed. The respondents who strongly disagreed were 50 representing 21.5% and 40 respondents representing 17.2% disagreed while 12 respondents representing 5.2% were undecided. Majority of the respondents who were 66 representing 28.3% agreed and 61 respondents representing 26.2% strongly agreed that reporting techniques adopted by the banks had enabled them to propagate data in records management.

The respondents who disagreed were 53 representing 22.7% and 47 respondents representing 20.2% strongly disagreed to it while 6 respondents representing 2.6% were undecided. Banks had been able to use the reporting techniques for tactical decision making since majority of the respondents who were 73 representing 31.3% agreed and 57 respondents representing 24.5% strongly agreed to it. The respondents who strongly disagreed were 59 representing 25.3% so do 32 respondents representing 13.7% who disagreed while 12 respondents representing 5.2% were undecided.

Reporting techniques contains live data and retain minimal information since majority of the respondents who were 77 representing 33.0% agreed to it as well as 46 respondents representing 19.7% strongly agreed to it. The respondents who strongly disagreed were 60 representing 25.8% and 38 respondents representing 16.3% disagreed to it while 12 respondents representing 5.2% were undecided. Majority of the respondents who were 73 representing 31.3% agreed and 56 respondents representing 24.0% strongly agreed that reporting techniques used by the banks facilitated end user analysis of data. The respondents who strongly disagreed to it were 60 representing 25.8% and 40 respondents representing 17.2% disagreed while 4 respondents representing 1.7% were undecided.

Reporting techniques adopted by the banks provided them with data used in departmental decision making as attested by majority of the respondents who were 62 representing 26.6% who agreed and 55 respondents representing 23.6% who strongly agreed to it. The respondents who disagreed were 54 representing 23.2% and 53 respondents representing 22.7% who strongly disagreed while 9 respondent representing 3.9% were undecided.

The business intelligence reporting techniques adopted by the banks provided support to business functions and processes in different departments as per the majority of the respondent who were 66 representing 28.3% who strongly agreed and 59 respondents representing 25.3% who agreed to it. The respondents who disagreed were 56 representing 24.0% as well as 48 respondents representing 20.6% who strongly disagreed while 4 respondents representing 1.7% were undecided. This implies that the reporting techniques which were adopted by banks assisted them to; discover trends and analyse critical factors; generate aggregate views on state of the business; store, analyse, project business; collect and integrate data; propagate data in records management, make tactical decision, facilitate end user analysis of data, provide data for departmental decision making and support business functions and process in different departments thus improves on the performance of the organization

4.9 Inferential Statistics

This section presents the results of inferential statistics that were used which included; Pearson correlation coefficient and multiple regression analysis.

4.9.1 Correlation Analysis

Correlation between variables is a measure of how well the variables are linearly related. The correlation coefficients results are between -1 and 1. A result of -1 means that there is a perfect negative correlation between the two values, while a result of 1 means that there is a perfect positive correlation between the two variables. Result of 0 means that there is no correlation between the two variables (Gujarat, 2004). Before carrying out a test on research hypotheses, the study examined how the predictor variables were related with the dependent variable. The results are presented on Table 4.12.

Table 4.12

Correlations

Correlation		BAT	MT	BKDT	RT
BAT	Pearson Correlation	1			
	Sig. (2-tailed)				
MT	Pearson Correlation	0.953**	1		
	Sig. (2-tailed)	0.000			
BKDT	Pearson Correlation	0.956**	0.946**	1	
	Sig. (2-tailed)	0.000	0.000		
RT	Pearson Correlation	0.926**	0.939**	0.946**	1
	Sig. (2-tailed)	0.000	0.000	0.000	

N= 233, **. Correlation is significant at the 0.01 level (2-tailed).

Source: Research Data (2019)

The results in Table 4.12 shows that there was a significant relationship between Measuring Techniques (MT) with Business Analysis Techniques (BAT) ($r = 0.953$, $n=233$, $p < 0.000$). Business knowledge discovery techniques (BKDT) had a significance relationship with Business Analysis Techniques (BAT) ($r = 0.956$, $n=233$, $p < 0.01$); Measuring Techniques (MT) ($r = 0.946$, $n=233$, $p < 0.01$) and Reporting techniques (RT) had significance relationship with Business Analysis Techniques (BAT) ($r = 0.926$, $n=233$, $p < 0.000$); Business knowledge discovery techniques (BKDT) ($r = 0.946$, $n=233$, $p < 0.000$); Measuring Techniques (MT) ($r = 0.939$, $n=233$, $p < 0.000$).

This implies that commercial banks need to embrace business intelligence analysis techniques, adopt performance measuring techniques, use business knowledge discovery techniques and implement reporting techniques so that they improve on their performance

4.9.2 Multiple Regression Analyses

A Multiple regression analysis was carried out to establish combined causal relationship between predictor variables and the dependent variable and also test the formulated research hypotheses.

Table 4.13

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.749[a]	0.724	0.723	0.35125

a. Predictors: (Constant), BAT, MT, BKDT, RT.

Source: Research Data (2019)

Table 4.13 present the model summary for the regression analysis between the predictor variables and the dependent variable. The overall R^2= 0.724 which indicates 72.4 percent of the variation in the dependent variable is explained by the predictor variables that are included in the model, while 27.4 % variation in the dependent variable is explained by other factors that are not included in the model denoted by (**ε)** in the model. A high degree of correlation among residuals of the regressions' data sets may produce inefficient results (Yupitun,2008).

Table 4.14

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	522.616	5	104.523	847.204	.000[b]
	Residual	28.006	227	0.123		
	Total	550.622	232			

a. Dependent Variable: Effective_BI

b. Predictors: (Constant), Influence_BKD, Influence_BIMT, Influence_MT, Effcetiveness_BKD, Influence_BI

Source: Research Data (2019)

As presented on table 4.14, the mean square of the residuals was very small (28.006) compared to mean square of the regression (522.616). Further, the F-statistics of the regression ($F_{(5, 227)} = 847.204$) which was statistically significant ($p<0.01$) indicates that the model significantly predict the change of the dependent variable as a result of the four predictor variables included in the model. This implies that the coefficients of the model are not equal to zero, suggesting that the model fits the data significantly.

Table 4.15

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.158	0.105		1.505	0.134
	BAT	0.582	0.089	0.545	6.528	0.000
	MT	0.089	0.086	0.083	1.026	0.306
	BKIDT	0.149	0.058	0.041	2.571	0.011
	RT	0.503	0.056	0.487	9.000	0.000

a. Dependent Variable: Effective_BI

Source: Research Data (2019)

The un-standardized betas values were used to determine combined influence of predictor variables (independent variables) on the dependent variable in the model. The results are summarized on Table 4.15. The un-standardized beta coefficients explain how the dependent variable varies as a result of a unit change in the independent variables. The findings reveals that Business analysis techniques used by banks influences performance by 58.2% , reporting techniques influence performance by 50.8%, business knowledge influence performance by 14.9% and measuring techniques influence performance by 8.9%. This means that commercial banks should adopt business intelligence analysis techniques and reporting techniques since they are more effective tools for improving performance.

4.10 Testing of Research Hypotheses

The following research hypotheses guided the study;

H_{01} There is no significant effect of Business Intelligence analytical techniques on organizational performance in banking sector in South Rift Counties in Kenya

H_{02} There is significant effect of Business Intelligence measuring techniques on organizational performance in banking sector in South Rift Counties in Kenya.

H_{03} There is no significant effect of Business Knowledge Discovery techniques on organizational performance in banking sector in South Rift Counties in Kenya.

H_{04} There is no significant effect of Business Intelligence Reporting techniques on organizational performance in banking sector in South Rift Counties in Kenya.

From the study the following were the results of the study hypothesis;

Table 4.16

Summary of Test of Hypotheses

Hypothesis	Results	Conclusion
H_{01}: There is no significant effect of Business Intelligence analytical techniques on organizational performance in banking sector in South Rift Counties in Kenya	Statistically significant relationship between Business Intelligence analytical techniques and organizational performance ($\beta = 0.582$, $p<0.00$)	H_{01} Rejected
H_{02}: There is no significant effect of Business Intelligence measuring techniques on organizational performance in banking sector in South Rift Counties in Kenya.	Statistically significant relationship between Business Intelligence measuring techniques and organizational performance ($\beta = 0.089$, $p<0.31$)	H_{02} Accept
H_{03}: There is no significant effect of Business Knowledge Discovery techniques on organizational performance in banking sector in South Rift Counties in Kenya.	Statistically significant relationship between Business Knowledge Discovery techniques and organizational performance ($\beta = 0.149$, $p<0.01$)	H_{03} Rejected
H_{04}: There is significant effect of Business Intelligence Reporting techniques on organizational performance in banking sector in South Rift Counties in Kenya.	Statistically significant relationship between Business Intelligence Reporting techniques and organizational performance ($\beta = 0.503$, $p<0.00$)	H_{04} Accept

Source: Researcher, (2019)

4.11 Discussion of the Findings

The first objective was to determine the effects of BI analytical techniques on organization performance in banking sector. Majority of the respondents who were129 (55.4%) agreed that data warehouse is a business intelligence technique which is a focal store of data that can be examined so as to settle on better decision.

This are in agreement with Sharma (2010) who noted that business intelligence is the collection, storing, statistical examination and apprehension of a lot of organizational information with the point of settling on better decisions and enhancing organizational performance and increasing competitive edge. Data mining which entails extracting information in a database was an effective business intelligence technique used by banks since majority of respondents who were 133 (57.1%) agreed to it. Data visualization by use of graphs, charts and tables to display summarized information enable easy comparison of the performance of bank had been adopted by majority of the banks according to the majority of the respondents who were 121 (52.3%).

Online analytical processing technique which is an automatic online analysis of data was used by majority of the banks as revealed by majority of the respondents who were 135 (59%). Statistical examination for making quantitative decisions about a process or process was used by most of the bank since majority of the respondents who were 135 (59%). Prescient model gave knowledge of events before they take place was used by majority of the banks as revealed by the majority of the respondents who were 121 (51.9%). Dash board used for progress report was embraced by majority of the banks since majority of the respondents who were 119 (51.1%). This concurs with Tan (2011) who said that information to be analyzed has been incorporated into one database or data warehouse from various operational databases, where analysis is effected utilizing procedures, for example, data mining, visualization, online analytical processing (OLAP), statistical examination and prescient models. It also agrees with Njuguna (2013) who uncovered that execution of business knowledge dashboard effectively enhanced decision making process.

The second objective was to examine the level of effectiveness of BI measuring techniques on organization performance in banking sector. Business intelligence analysis techniques enable quick decision making according to the majority of the respondents who were 130 (55.8%); it leads to increase in the number of customer value as agreed by a majority of the respondents who were 120 (51.4%); it empowers executive to make right projection as agreed by majority of the respondents who were 128 (33.1%) and it minimizes risks and uncertainties since majority of who were 121 (51.9%). Control and management of situations are actualized with the use of business intelligence analysis techniques as agreed by a majority of the respondents who 124 (53.2%). Banks who use business intelligence analysis techniques are more competitive that those who do not use it, this is as per the response of the majority of the respondents who were 120 (51.5%). This findings are in agreement with Sharma (2010) who observed that uses of business analytics can add to organizational performance, for example, in promotions that can enhance client benefit, enhance value of internet business, additionally production and manufacturing, sales and forecast, production designs, in finance, human asset and innovative work.

It also concurs with Xia and Gong (2012) who noted that business analysis encourages quicker and more precise reporting, and enhances decision making, enhances client services and expands income. The study findings also agrees with Ranjan (2008), who said that business analysis device gives basic understanding in empowering organizations to settle on the right and auspicious choices and encourages the investigation of different parts of business tasks to raise new income or save money on costs by expanding rate of return and supporting information decisions thus becomes competitive.

The third objective was to establish the impact of Business Knowledge Discovery techniques on organization performance in banking sector. Business knowledge discovery techniques was used to; discover patterns and relationship hidden in data according to the response of the majority of the respondents who were 126 (54.3%); enumerate patterns as agreed by majority of the respondents who were 144 (61.8%); evaluate product according to the majority of the respondents who were 131 (56.3%); identification of subset of enumerated patterns according to majority of respondents who were 116 (52.3%); generation of theory according to 131 respondents representing 56.2% agreed. Business knowledge discovery techniques were used for strategic planning according to majority of the respondents who were 129 (55.4%); enhance customer relationship according to majority of the respondents who were 133 (57.1%); it helped banks to monitor operations according to majority of the respondents who were 131 (56.2%); to enhance the study of product profitability according to majority of the respondents who were 147 (63.0%) and assisted in data collection, storage and processing as noted by majority of the respondents who were 137 (60.9%).

The finding concurs with Davenport (2010) who mirrored that BI systems are a very essential element of the new information infrastructures because they make a contribution for both, success and efficiency. These are generally used by managers whilst introducing new techniques to manage businesses in a better and more focused way. It was also in agreement to the findings of Wixom and Watson, (2010) who noted that BI systems can be utilized as a part of key planning, customer relationship management, checking tasks and to contemplate the benefit of products.

They are another way to manage an organization and another method for gathering, storing, preparing, examining, and utilizing data as fortified by (Williams and Williams, 2007). It also concurs with Wixom and Watson, (2010) in their investigation who noted that these frameworks allude to making choices, data examination and knowledge administration. As indicated by Azvine (2006), BI is about the catch, access, understanding and the examination of crude data into information/knowledge so as to enhance business. Wells in his investigations (2003) agrees with the findings of this study since he noted that the ability of an enterprise to clarify, design, anticipate and tackle issues, think abstractly, comprehend, invent, and learn with the goal that organizational information can increase, give data for decision making process, empower successful activities, and support building up and accomplishing business objectives.

The fourth objective was to evaluate the influence of BI Reporting techniques on organizational performance in banking sector. Reporting techniques used by banks had enable them to discover trends and analyse critical factors according to the majority of the respondents who were 128 (54.6%), it had also enabled them to generate aggregate views on state of the business, this is according to majority of the respondents who were 154 (66.1%). Banks had been able to store and analyse project with the help of reporting techniques they had adopted since majority of the respondents who were 139 (59.7%) agreed. Reporting techniques had enable banks to collect and integrate data according to majority of the respondents who were 131 (56.2%) who agreed; it had enabled them to propagate data in records management according to the majority of the respondents who were 127 (54.5%) agreed.

Banks had been able to use the reporting techniques for tactical decision making since majority of the respondents who were 130 (55.8%) agreed. Reporting techniques contains live data and retain minimal information according to majority of the respondents who were 123 (52.7%). Majority of the respondents who were 129 (55.3%) noted that reporting techniques used by the banks facilitated end user analysis of data; it provided them with data used in departmental decision making as attested by majority of the respondents who were 117 (50.2%) and that it provided support to business functions and processes in different departments as per the majority of the respondent who were 125 (53.6%).

These findings are in agreement with Olszak and Ziemba, (2007) who noted that crucial usefulness of BI techniques can be condensed as storing, integrating, coordinating and organizing data; querying and reporting information; and knowledge extraction. They further stated that BI techniques most cases offer a coordinated and integrated arrangement of systems, technologies and software products that are utilized to incorporate heterogenic data from circulated sources and break down the incorporated data with the goal that extricated knowledge can regularly be utilized. The study also agrees with the findings of the studies done by Ranjan,(2009) which revealed that there are other BI techniques which are utilized to store and dissect information, for example, data mining and data warehouse; decision support systems and forecasting; document ware house and record management; knowledge management; mapping, knowledge management, data visualization and dash boarding; management information systems.

The findings of this study concurs also with the findings of Sharma (2010), who found out that availability of large integrated databases and development of powerful techniques of visualization and data analysis generated interest in business analytics for improvement of decision making hence better organizational performance and enhanced competitive advantage.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the research findings regarding the research objectives, draws conclusions and makes recommendations for further study.

5.2 Summary

The purpose of the study was to establish the effect of Business Intelligence Techniques on organizational performance in Banking Sector in Kenya. Specific the study sought to; determine the effect of BI analytical techniques on organization performance in banking sector; examine the level of effectiveness of BI measuring techniques on organizational performance in banking sector; establish the impact of Business Knowledge Discovery techniques on organization performance in banking sector and evaluate the influence of BI Reporting techniques on organizational performance in banking sector. Primary data was used and was collected using self administered structured questionnaire from a sample of 246 respondents where responses was received from 233 respondents indicating a response rate of 94.7%. Data was analyzed using descriptive and inferential statistics.

Both genders constituted the working force in the Commercial Banks in Counties in South Rift Region but the majority of these employees were male. The findings also reveal that the commercial banks adhere to one third gender rule as stipulated in the Constitution of Kenya (2010).

Majority of respondents had the basic qualification and the necessary skills and experience hence were qualified to respond to the question on the effects of Business Intelligence Techniques on organizational performance in Banking Sector in Kenya. The ages of the respondents were distributed and balanced across the working age groups in the Commercial Banks in Counties in South Rift Region.

5.2.1 Effect of BI Analytical Techniques on Organization Performance

Majority of the respondents who were 129 (55.4%) agreed that data warehouse is a business intelligence technique which is a focal store of data that can be examined so as to settle on better decision. Data mining which entails extracting information in a database was an effective business intelligence technique used by banks since majority of respondents who were 133 (57.1%) agreed. Data visualization by use of graphs, charts and tables to display summarized information which enabled easy comparison of the performance of bank had been adopted by majority of the banks according to the majority of the respondents who were 121 (52.3%). Online analytical processing technique which is an automatic online analysis of data was used by majority of the banks as revealed by majority of the respondents who were 135 (59%). Statistical examination for making quantitative decisions about a process or process was used by most of the bank according to the majority of the respondents who were 135 (59%). Prescient model used to give knowledge of events before they take place was used by majority of the banks as revealed by the majority of the respondents who were 121 (51.9%). Dash board used for progress report was embraced by majority of the banks since majority of the respondents who were 119 (51.1%).

5.2.2 Level of Effectiveness of BI Measuring Techniques on Organization Performance

Business intelligence measuring techniques enabled quick decision making according to the majority of the respondents who were 130 (55.8%); it lead to increase in the number of customer value as agreed by a majority of the respondents who were 120 (51.4%); it empowers executive to make right projection as agreed by majority of the respondents who were 128 (33.1%) and it minimizes risks and uncertainties as per majority of respondents who were 121 (51.9%). Control and management of situations are actualized with the use of business intelligence measuring techniques as agreed by a majority of the respondents who 124 (53.2%). Banks who use business intelligence measuring techniques are more competitive than those who do not use it, this is as per the response of the majority of the respondents who were 120 (51.5%).

5.2.3 Effect of Business Knowledge Discovery Techniques on Organization performance

Business knowledge discovery techniques was used to; discover patterns and relationship hidden in data according to the responses of the majority of the respondents who were 126 (54.3%); enumerate patterns as agreed by majority of the respondents who were 144 (61.8%); evaluate product according to the majority of the respondents who were 131 (56.3%); used in the identification of subset of enumerated patterns according to majority of respondents who were 116 (52.3%); generation of theory according to 131 (56.2%) respondents. Business knowledge discovery techniques were used for strategic planning according to majority of the respondents who were 129 (55.4%); it enhanced customer relationship according to majority of the respondents who were 133 (57.1%).

Business knowledge discovery techniques helped banks to monitor operations according to majority of the respondents who were 131 (56.2%); it enhanced the study of product profitability according to majority of the respondents who were 147 (63.0%) and assisted in data collection, storage and processing as noted by majority of the respondents who were 137 (60.9%).

5.2.4 Effect of BI Reporting Techniques on Organizational Performance

Reporting techniques used by banks had enable them to discover trends and analyse critical factors according to the majority of the respondents who were 128 (54.6%), it had also enabled them to generate aggregate views on state of the business, this is according to majority of the respondents who were 154 (66.1%). Banks had been able to store and analyse project with the help of reporting techniques they had adopted since majority of the respondents who were 139 (59.7%) agreed. Reporting techniques had enable banks to collect and integrate data according to majority of the respondents who were 131 (56.2%); it had enabled them to propagate data in records management according to the majority of the respondents who were 127 (54.5%). Banks had been able to use the reporting techniques for tactical decision making since majority of the respondents who were 130 (55.8%) agreed. Reporting techniques contained live data and retain minimal information according to majority of the respondents who were 123 (52.7%). Majority of the respondents who were 129 (55.3%) noted that reporting techniques used by the banks facilitated end user analysis of data; it provided them with data used in departmental decision making as attested by majority of the respondents who were 117 (50.2%) and that it provided support to business functions and processes in different departments as per the majority of the respondent who were 125 (53.6%).

5.3 Conclusions

The study makes the following conclusion;

5.3.1 Effect of BI Analytical Techniques on Organization Performance

Data warehouse is a business intelligence technique which is a focal store of data that can be examined so as to settle on better decision thus assist in decision making by the executives hence banks need to embrace it. Data mining entails extracting information in a database and is an effective business intelligence technique which banks need to use. Data visualization by use of graphs, charts and tables to display summarized information enables easy comparison of the performance of bank. Online analytical processing technique which is an automatic online analysis of data need to be adopted and be used by banks for them to be able to improve on their performance Statistical examination for making quantitative decisions about a process or process ought to be used by banks so do prescient model used to give knowledge of events before they take place as well as dash board for progress report.

5.3.2 Level of Effectiveness of BI Measuring Techniques on Organization Performance

Business intelligence measuring techniques enables quick decision making; it lead to increase in the number of customer value; it empowers executive to make right projection and it minimizes risks and uncertainties thus banks that use these techniques are performing well. Control and management of situations are actualized with the use of business intelligence measuring techniques thus banks need to use them so that they become more competitive.

5.3.3 Effect of Business Knowledge Discovery Techniques on Organization Performance

Business knowledge discovery techniques enabled banks to; discover patterns and relationship hidden in data; enumerate patterns; evaluate product; identify subset of enumerated patterns and facilitate generation of theory. Business knowledge discovery techniques were used by banks for strategic planning; to enhance customer relationship; to helped in monitor operations; to enhance the study of product profitability and assisted in data collection, storage and processing.

5.3.4 Effect of BI Reporting Techniques on Organizational Performance

Reporting techniques used by banks enabled them to discover trends and analyse critical factors and generate aggregate views on state of the business. Banks can store and analyse project with the help of reporting techniques they adopt since it enabled them to collect and integrate data and propagate data in records management. Banks can use the reporting techniques for tactical decision making since it contains live data and retain minimal information which facilitates end user analysis of data and provide data used in departmental decision making thus provide support to business functions and processes in different departments concurrently.

5.4 Recommendations

The study recommends that the banks need to effectively use BI systems since it brings better organizational performance through use of business analysis techniques, business measuring techniques, business knowledge discovery techniques and reporting techniques.

Awareness about the capabilities of BI is quite low among these Commercial banks hence banks need to be sensitized on the benefits of using business intelligence since knowledge management is one of the most important key factors of competition and productivity growth and in today's competing business environment, companies should consider the competitive advantages of BI tools that provide much more advanced analysis options for organizational data. On the other hand, organizations should overcome the technical and organizational challenges of implementing BI in order to achieve an efficient utilization of it since BI improves the business performance and improves the overall performance of the organization. More specifically, banks that are equipped with BI have higher association between their operations and business performance and that banks that collect and analyze data using BI outperform those who do not.

5.5 Suggestions for Further Research

Further study can be done by replicating the research objectives with longitudinal data so as to unfold the causal relationship among variables over a longer period of time. Future research can replicate the present study on organizations that are using customized BI techniques developed in-house with those which use over the counter BI Software's.

REFERENCES

Allen, F., Carletti, E., Cull, R., Qian, J.,Senbet, L., Valenzuela, P. (2013), Improving access to banking evidence from Kenya, *Policy Research Working Paper* 6593, The World Bank Development Research Group Finance and Private Sector Development Team September 2013.

Almajali, D. A., Dahalin, Z. M. (2011), Factors influencing IT business strategic alignment and sustainable competitive advantage: a structural equation modeling approach, *IBIMA Publishing*, Vol. 2011 (2011), Article ID 261315, 12 pages.

Beck, T.,Fuchs, M. (2004), Structural issues in the Kenyan financial system: improving competition and access, *World Bank Policy Research Working Paper* 3363.

Beck, T., Cull, R., Fuchs, M., Getenga, J., Gatere, P., Randa, J., Trandafir, M.(2010). Banking sector stability, efficiency, and outreach in Kenya, *Policy Research Working Paper* 5442, The World Bank Development Research Group Finance and Private Sector Development Team October 2010.

Bucher, T., Gericke, A., Sigg, S., (2009), Process-centric business intelligence, *Business Process Management Journal*, 15 (3), 408-429

Buluma, O., (2012), Strategies adopted by co-operative bank of Kenya in response to loan defaulters among the small and medium enterprises in Kenya, Unpublished

Boonsiritomachai, W., M. McGrath, and S. Burgress. (2014). A research framework for the adoption of Business Intelligence by Small and Medium-sized enterprises. Small Enterprise Association of Australia and New Zealand, 27th *Annual SEAANZ Conference*

Borut, P., T. Oliveira, and A. Popovic. 2014. Unpacking business intelligence systems adoption determinants- an explanatory study of small and medium enterprises. *Economic and Business Review*, 16, (2), 185-213.

Business Week Research Services for SAS, (2009), The customer you know: keeping, leveraging, and profiting from current customers with business analytics.

Capgemini Consulting. (2012). Electronic references. Retrieved fromhttp://www.capgemini.com/blog/capping-it-off/2012/04/four-key-challenges-forbusiness-analytics retrieved on 2nd May 2019.

Central Bank of Kenya, (2013). *Electronic references*. Retrieved from http://www.centralbank.go.ke. Retrieved on 15th April 2019

Chen, H., Chiang, R. H. L., Storey, V. C., (2012), Business intelligence and analytics: from big data to big impact, *MIS Quarterly* 36, (4), 1-24.

Chen, J. 2006. Development of Chinese small and medium-sized enterprises. *Journal of Small Business and Enterprise Development*, 13, (1) 140-147.

Chen, M. 2003. Factors affecting the adoption and diffusion of XML and web services standards for E-business systems. *International Journal Human- Computer Studies*,58,(1) 259-279.

Curko, K., Bach, M. P., and Radonic, G. (2007). Business intelligence and business process management in banking operations. In Information Technology Interfaces, 2007. ITI 2007. 29th *International Conference* (57–62). IEEE.10.1109/ITI.2007.4283744

Davenport, T. H. (2006), Competing on analytics, *Harvard Business Review*, 1-10.

Decision path Consulting (2010), How effectively are companies using business analytics*? Decision Path Consulting Research.*

Devinney, T.M., Richard, P.J., Yip, G.S., and Johnson. G. (2008), Measuring organizational performance in management research: a synthesis of measurement challenges and approaches, *Research Paper,* Available at www.aimresearch.org.

DECSUP-11718; B. S., Gong, P., (2014), Review of business intelligence through data analysis

Decisionpath Consulting (2010), How effectively are companies using business analytics? *Decision Path Consulting Research*.

Dillon, A. and M. Morris. 1996. User acceptance of new information technology Theories and models. *Annual Review of Information Science and Technology*, 31, (1), 332.

DBA Africa Management Review August 2013, 3 (2) 70-80.

Nazir, S., Naseer, Akhtar, M.N., Irshad, M. Z., Why banks and financial institutions in Pakistan are turning towards Internet banking?, *IJCSI International Journal of Computer Science* 8, (6), 265-274.

Esfandiari, M., Rizvandi, M. (2014), An application of TOPSIS method for ranking different strategic planning methodology, *Management Science Letters* 4, 1445–1448.

Green, A. (2007), Business information – a natural path to business intelligence: knowing what to capture, VINE: *The journal of information and knowledge management systems*. 37, (1), 18-23.

Grossman, R. and Siegel, K. (2014), Organizational Models for Big Data and Analytics, *Journal of Organization Design, JOD,* 3(1): 20-25.

Green, A. (2007), Business information – a natural path to business intelligence: knowing what to capture, VINE: *The journal of information and knowledge management systems,* 37 (1), 18-23.

Fayyad, U. and Piatetsky-Shapiro, G. and Smyth, P. (1996). "Knowledge Discovery and Data Mining: Towards a unifying framework", *in Proceedings of The Second International Conference on Knowledge Discovery and Data Mining*, Portland, 82-88.

H.J. Watson and B.H. Wixom "The Current State of Business Intelligence", *Computer* 40 (9),

Indiatsy, C., Mwangi, M., Mandere, E., Bichanga, J., and Gongera, G., The application of Porter's five forces model on organization performance: A case of Cooperative Bank of Kenya Ltd, *European Journal of Business and Management*.6, (16).

Kanog, J. N. (2013), Effects of electronic banking in international business environment and performance, *Diamond Trust Bank Limited In Kenya,*

Kohavi, R., Rothleder, N. J., Simoudis, E. (2002), Emerging trends in business analytics, *Communications Of The ACM* 45, (8), 45-48.

Lim, E.-P., Chen, H., Chen, G. 2012. Business intelligence and analytics: Researchdirections. *ACM Trans. Manage. Inf. Syst.* 3, (4), 17

Loshin, D. (2003). *Business Intelligence* - The Savvy Manager's Guide, Morgan Kaufmann, Maryland.

Lupu, A.M., Bologa, R., Lungu, I and Bra, A 2007, 'The impact of organization changes on business intelligence projects', *Proceedings of the 7th WSEAS International Conference on Simulation, Modeling and Optimization*, Beijing, China, September 15-17, pp.414-418.

Masa'deh, R., Hunaiti, Z., Yaseen, A. A. B. (2008), An Integrative Model Linking IT Business Strategic Alignment and Firm Performance: The Mediating Role of Pursuing Innovation and Knowledge Management Strategies, *Communications of the IBIMA* 2, (1) 180-187.

MBA Thesis. University of Nairobi. Business Week Research Services for SAS, (2009), *The Customer You Know: Keeping, Leveraging, and Profiting from Current Customers with Business Analytics.*

Mbaluka, W. (2013), Big Data Management and Business Value In The Commercial Banking Sector In Kenya, Unpublished MBA Thesis. University of Nairobi.

Moldovan, D. (2011). Business intelligence: Data mining in finance. business intelligence: *Data mining in finance,* 6.

Masa'deh, R., Hunaiti, Z., Yaseen, A. A. B. (2008), An integrative model linking it business strategic alignment and firm performance: the mediating role of pursuing innovation and knowledge management strategies, *Communications of the IBIMA* 2, (1) 180-187.

Mbaluka, W. (2013), Big data management and business value in the commercial banking sector in Kenya, *Unpublished MBA Thesis.* University of Nairobi.

Mulatya, P. (2012), Factors that determine internationalization process of commercial banks in kenya, *Unpublished MBA Thesis.* University of Nairobi.

Muriuki, J. M. (2011), Effect of technology adoption on agency banking among commercial banks in Kenya, *Unpublished MBA Thesis*. University of Nairobi.

Mutuku, C., K'Obonyo, P., Awino, Z. B., Musyoka, M. (2013), Top management team diversity, involvement culture and performance of Commercial Banks in Kenya**,**

Naibei, I.K., Aila FO, Korir J, Adoyo P, Mule R.K, Ogut A.S, Onchonga, D.M, Okungu AEO, Omoke JO, Momanyi G, (2015). Determinants of Tax Compliance among Small Taxpayers in Western Kenya. *Greener Journal of Economics and Accountancy*, 4 (1):009020, http://doi.org/10.15580/GJEA.2015.1.012914079

Negash, S. (2004). Business intelligence. *The Communications of the Association for Information Systems,* 13(1), 54.

Petrini, M. and Pozzebon, M. (2009). "Managing sustainability with the support of business intelligence: Integrating socio-environmental indicators and organizational context", *Journal of Strategic Information Systems,* 18, 178–191.

Njuguna, J. W. (2013), Adoption Of Business Intelligent Dashboard And Decision Making At Kenya Power, *Unpublished MBA Thesis*. University of Nairobi.

Olexová, C. 2014. Business intelligence adoption- a case study in the retail chain. *WSEAS Transactions on Business and Economics*, 11.

Oliveira, T. and M. Martins, F. 2011. Literature review of information technology adoption models at firm level. *The Electronic Journal Information Systems Evaluation,* 14, (1), 110-121.

Otieno, V. A. (2010). Application of ICT strategy in enhancing competitive advantage among commercial banks in Kenya, *Unpublished MBA Thesis*. University of Nairobi.

Owusu, A., and Liu, S. (2017). Business intelligence systems and bank performance in Ghana: The balanced scorecard approach. *Cogent Business and Management,* 4 (1).

Peteraf, M. A., (1993), The cornerstones of competitive advantage: a resource-based view, *Strategic Management Journal*, 14, 179-1 91.

Petrini, M. and Pozzebon, M. (2009). "Managing sustainability with the support of business intelligence: Integrating socio-environmental indicators and organizational context", *Journal of Strategic Information Systems,* 18, 178–191.

Puiu, C., Stanciu, M. (2008), Some theoretical aspects concerning the strategies' definition and typology, *Annals of the University of Petroşani, Economics,* 8(2),

Ranjan, J. (2008), Business justification with business intelligence, *The journal of information and knowledge management systems*. 38 (4), 2008

Rygielski, C. and Wang, J. C. and Yen, D. C. (2002). "Data Mining Techniques for Customer Relationship Management", *Technology in Society,* 24, 483–502

Sharma, R. , Reynolds, P., Scheepers, R., Seddon, P. B., Shanks, G. (2010), Business Analytics and Competitive Advantage: A Review and a Research Agenda, Bridging the Socio-technical Gap in Decision Support Systems, *IOS Press*, 2010,

Senge, P. (1994) The Fifth Discipline: *The Art & Practice of the Learning Organization*. New York: Currency Doubleday.

Trkman, P., McCormack, K., de Oliviera, M. P. V., Ladeira M. B., (2010), The impact of business analytics on supply chain performance, Decision Support Systems, DECSUP-11718.

Tambe, P. (2014), Big data investment, skills, and firm value, *Management Science* 60(6):1452-1469.

Tan, C., Sim, Y., and Yeoh, W. (2011), A maturity model of enterprise business intelligence, *IBIMA Publishing* 2011, Article ID 417812.

Thompson S. H. Teo & James S. K. Ang (2000) How useful are strategic plans for information systems?, *Behaviour & Information Technology*, 19:4, 275-282, DOI: 10.1080/01449290050086381

Venkatraman, N. (1989). Strategic orientation of business enterprises: the construct, dimensionality, and measurement. *Management science*, *35*(8), 942-962.

Venter, P., and Tustin, D. (2009). The availability and use of competitive and business intelligence in South African business. *Southern African Business Review* 13, 114.

Xia, B. S., Gong, P., (2014), Review of business intelligence through data analysis, Benchmarking: *An International Journal*. 21 (2).

Y.L.Thong., J. 1999. An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*, 15, (1)

Williams, S., and Williams, N. 2010. The profit impact of business intelligence, (Morgan Kaufmann.

Wong, K. K.-K. 2013. "Partial Least Squares Structural Equation Modeling (PLS-SEM) Techniques Using SmartPLS," *Marketing Bulletin* (24), 1-32.

Wixom, B., and Watson, H. (2010). The BI-based organization. *International Journal of Business Intelligence Research (IJBIR)*, *1*(1), 13-28.

Watson, H. J., and Wixom, B. H. (2007). The current state of business intelligence. *Computer*, *40*(9), 96-99.

APPENDICES

Appendix I: Questionnaire

This questionnaire is designed to collect information on the **Effectiveness of Business Intelligence Techniques on Organizational Performance; a Survey of selected Commercial Banks in counties in south rift region in Kenya.** The information obtained will only be used for academic purposes and shall be treated in utmost confidence. You are requested to complete this questionnaire as honestly and objectively as possible. Note that you are not required to indicate your name anywhere on the questionnaire.

PART1: Preliminary Data (tick as applicable)

1. **Gender**

   Male ☐

   Female ☐

2. **Level of education**

   Primary ☐

   Secondary ☐

   College ☐

   University ☐

3. **Work experience (years)**

   Less than 2yrs ☐ Over 10yr

   2 – 5years ☐

   6 – 9years ☐

   ☐

4. Age

Less than 25yrs ☐

25 – 35years ☐

36 – 45years ☐

55 yrs and above ☐

5. Marital status

(a) Single ☐

(b) Married ☐

PART B Business intelligence analysis techniques on organization performance in banking sector.

Indicate the extent to which you agree or disagree with the following use of Business intelligence analytical techniques in our organization. Use the scale of 1 to 5 where 1 is Strongly Disagree, 2 is Disagree, 3 is Undecided, 4 Agree and 5 is Strongly Agree

	BI Analysis Techniques	1	2	3	4	5
6	Raw data are transformed into information by use of data warehouse and are analysed in our organization effectively					
7	Data mining aids faster data analysis in my organization.					
8	Data visualization is a method used to analyse and present information in your organization					
9	Online Analytical processing (OLAP) facilitates the analysis of information online in your organisation.					
10	Statistical examination is a tool used to enhance data					

	analysis in your organization.					
11	Prescient models aids the analysis of information in your organisation					
12	Dash board has an effect on the analysis of information in your organisation.					

Use the scale below to rate the effects of Business intelligence analysis techniques has on organization performance in your bank. **(Tick accordingly**)

(SA - Strongly Agree, S – Agree, U- Undecided, D – Disagree, SD - Strongly Disagree)

Influence of Business intelligence analysis techniques

	Effects	SA	A	U	D	SD
13	Enhance quick decision making in your organisation.					
14	Increased customer value in your organization					
15	Empower Executive to make right projections in your organisation.					
16	Minimize risks or uncertainties in your organisation					
17	Control and manage situations in your organisation					
18	Improve competitive advantage of your organisation					

PART III Influence of Measuring techniques on Organization Performance in Banking Sector

Indicate the level of your agreement whether the following types of measuring techniques are useful in your organization.? (Tick as applicable)

	Techniques	**SA**	**A**	**U**	**D**	**SD**
19	Balance scorecard is used to measure the performance of your organisation					
20	Destination statement is used to influence the performance of an organisation					
21	Strategic objectives are key parameters of organisational performance.					
22	Strategic linkage model and perspectives are useful in measuring organisational performance					
23	Measures and initiatives influences organisational performance.					
24	Others					

Use the scale below to rate the level of Influence of Business intelligence measuring techniques on organization performance in your bank. **(Tick accordingly**)

(SA - Strongly Agree, S – Agree, U- Undecided, D – Disagree, SD - Strongly Disagree)

Influence of Business intelligence measuring techniques

	Influence	SA	A	U	D	SD
25	Balanced score card influences organisational performance					

26	Destination statements positively influences organisational performance in your organisation					
27	Strategic objectives has positive influence to organisational performance					
28	Strategic linkage model and perspective influences organisational performance positively.					
29	Measures and initiatives in your organisation influences performance positively.					

PART IV 13 Effectiveness of Business Knowledge Discovery techniques on Organization Performance in Banking Sector (Tick whichever is applicable)

Influence of Business Knowledge Discovery techniques on Organization Performance in Banking Sector. (SA - Strongly Agree, S – Agree, U- Undecided, D – Disagree, SD - Strongly Disagree)

	Effect of Business Knowledge Discovery Techniques	SA	A	U	D	SD
30	Discovers patterns and relationships hidden in organisational data					
32	Enumerate data patterns in your organisation					
33	Evaluate products in your organisation					
34	Identification of subsets of enumerated patterns in your					

	organisation.					
35	Generate management theories in your organisation.					
36	Help in strategic planning in your organisation.					
37	Enhance Customer Relationship in your organisation					
38	Help to monitor operations in your operations					
39	Enhance the study of product profitability in your organisation					
40	Assist in data collection, storage and data processing in your organisation					

PART V. Influence of Reporting Techniques on Organizational Performance in Banking Sector

(AS- Strongly Agree**, A-**Agree**, U –** undecided**, D-** Disagree**, SD-** Strongly Disagree)

	Level Of Influence	**SA**	**A**	**U**	**D**	**SD**
41	Discover trends and analysis of critical factors in your organisation					
42	Generate aggregate views on state of the business in your organisation.					
43	Store, analyse, project business performance in your organization.					
44	Collect and integrate data in your organisation.					
45	Propagate data and records management in your					

	organisation.					
46	Applied in tactical decision making process in your organisation.					
47	Contains live data and retain minimal information in your organisation.					
48	Facilitate end user analysis of data in your organisation					
49	Provide data for departmental decision making in your organisation					
50	Support business functions and process in different departments in your organisation.					

Appendix III: Research License